Revised Report Addendum for Additional Data Collection in the Phase 1A Area

Omega Chemical Superfund Site
Whittier, California

March 30, 2005

Submitted to:

U.S. Environmental Protection Agency
Region IX

Prepared for:

Omega Chemical Site PRP Organized Group

Prepared by:

CDM
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Project No. 10500-37240.T1.GW.REPORT

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March 31, 2005

Mr. Chris Lichens
Superfund Division (SFD-7-4)
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, California 94105-3901

Subject: Submittal of Revised Report Addendum for Additional Data Collection in the Phase 1a Area
Omega Chemical Superfund Site
CDM Project No. 10500-37240-T1.GW.REPORT
CDM File No. 10500-5.2.3

Dear Mr. Lichens:

On behalf of the Omega Chemical Site PRP Organized Group (OPOG), Camp Dresser & McKee Inc. (CDM) is herein submitting two copies of the Revised Report Addendum for Additional Data Collection in the Phase 1a Area. One copy of the document has also been transmitted to each individual indicated below.

Please feel free to contact me (949/930-2941) or Chuck McLaughlin (951/222-0387) if you have any questions.

Sincerely,

CAMP DRESSER & MCKEE INC.

Sharon Wallin

Sharon L. Wallin, R.G.
Project Manager

Enclosure

cc: Tom Perina, CH2MHill
Lori Parnass, DTSC
Chuck McLaughlin, de maximis, inc.

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The information contained in the document *Revised Report Addendum for Additional Data Collection in the Phase 1a Area Omega Chemical Superfund Site*, dated March 30, 2005, has received appropriate technical review and approval. The conclusions and recommendations presented represent professional judgments and are based upon findings from the investigations and sampling identified in the report and the interpretation of such data based on our experience and background. This acknowledgement is made in lieu of all warranties, either expressed or implied. The activities outlined in this report were performed under the supervision of a California Registered Geologist.

Reviewed and Approved by:

REGISTERED GEOLOGIST
SHARON L WALLIN
4399
exp. 4/06
STATE OF CALIFORNIA

Sharon Wallin

Sharon Wallin, R.G.
Project Manager

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Section 1
Introduction

On behalf of the Omega Chemical Site PRP Organized Group (OPOG), Camp Dresser & McKee Inc. (CDM) has prepared this Revised Report Addendum for Additional Data Collection in the Phase 1a Area of the Omega Chemical Superfund Site (Site). The Site is located at 12504 East Whittier Boulevard in Whittier, California (see Figures 1-1, 1-2, and 1-3 for illustrations of Site location, vicinity, and Phase1a area, respectively). The activities described in this document were performed in partial fulfillment of Tasks 1 and 3 of the Statement of Work included in Consent Decree No. 00-12471 between USEPA and OPOG. The Consent Decree was lodged on November 24, 2000 and entered into the U.S. District Court on February 28, 2001.

1.1 Background

Under USEPA Administrative Order 95-15, OPOG performed an initial investigation of the Phase 1a area (see Figure 1-3) during June and July 1999 in accordance with the Final Sampling and Analysis Plan (SAP) Phase 1a Field Investigation (CDM, April 23, 1999). As part of the initial investigation, three groundwater monitoring wells (OW1b, OW2 and OW3) were installed in the Phase 1a area and sampled. An existing on-site well (OW1) was also sampled. In addition, well OW2 was test pumped at four steps (1.15, 2.50, 3.75, and 5.50 gallons per minute [gpm], respectively), with each pumping step lasting approximately one hour.

The results of the initial investigation were detailed in the USEPA-approved Phase 1a Pre-Design Field Investigation Report (CDM, October 13, 1999). The Phase 1a report recommended the following to assist in selecting the most appropriate location for groundwater containment:

- Additional confirmatory sampling to verify the volatile organic compound (VOC) concentrations detected in newly-installed Omega well OW1b.
- Additional investigations to further understand hydraulic conductivity and transmissivity conditions along or downgradient of Putnam Street.
- Installation of a sentinel well on Washington Boulevard to characterize the lateral variability of hydrostratigraphic conditions and assist in determining if the low permeability conditions indicated at OW2 and OW3 are laterally continuous and persistent, or if preferential pathways of higher hydraulic conductivity exist.

With the approval of the Phase 1a Report, OPOG completed all work required by Order 95-15 and negotiated the current Consent Decree (No. 00-12471) with USEPA.

In accordance with Task 3 of the current Consent Decree, OPOG installed four downgradient wells (formerly referred to as sentinel wells). The four wells (OW4a, OW4b, OW5 and OW6) were installed during March through August 2001 in accordance with the USEPA-approved Downgradient Well Installation and

Groundwater Monitoring SAP (CDM, April 20, 2001). The Downgradient Well SAP also specified the collection of quarterly groundwater samples and monthly water level monitoring for one year from all Omega wells. Groundwater samples were collected from the Omega wells during mid-May, mid-August, and mid-November 2001 and mid-February 2002.

In May 2001, USEPA requested that OPOG install and sample an additional groundwater monitoring well upgradient of the site. Additional data requirements for the proposed groundwater remedy were also discussed in a Technical Memorandum from OPOG to USEPA dated October 31, 2001. The Technical Memorandum identified the following additional data requirements:

- Installation of a third monitoring well at Putnam Street, between wells OW2 and OW3, to verify the lateral distribution of VOCs at this location and to collect additional hydrostratigraphic and hydraulic data at this location;

- Performance of single well aquifer recovery tests at wells OW2, OW3, OW4a and the new Putnam Street well location to provide better estimates of hydraulic conductivity at these locations; and

- Addition of 1,4-dioxane, metals, bioparameters (e.g., electron donors and receptors), total dissolved solids (TDS), total organic carbon (TOC), and chemical oxygen demand (COD) to the analytical suite for the next round of sampling at wells OW1, OW1b, OW2, OW3, OW4a and OW4b.

Wells OW7 (upgradient well) and OW8 (Putnam well) were installed and sampled in March 2002. Well drilling, installation, development, and sampling activities were performed in accordance with the procedures specified in the Downgradient Well SAP.

Following the completion of quarterly sampling and monthly water level monitoring in mid-February 2002, OPOG initiated semi-annual sampling of all 10 Omega wells. Semi-annual sampling was performed during mid-August 2002 and mid-February 2003 in accordance with the SAP Addendum for Additional Data Collection in the Phase 1a Area (CDM, May 31, 2002). The additional data requirements listed above from the Technical Memorandum formed the basis of the activities described in the SAP Addendum. In addition to groundwater monitoring, the SAP Addendum also specified short-term constant discharge and recovery aquifer testing and sampling of wells OW2, OW3, OW4a and OW8. Aquifer testing and sampling of these wells was performed mid-March 2003.

A draft Report Addendum presenting the results of the additional data collection activities (semi-annual groundwater sampling and water level monitoring, and aquifer testing and sampling), in addition to prior quarterly groundwater sampling and monthly water level monitoring activities was submitted to USEPA in June 2003 (CDM, June 27, 2003, Report Addendum for Additional Data Collection in the Phase 1a Area). USEPA comments to the draft report were provided in correspondence dated October 15, 2003. USEPA requested that these comments be incorporated into future data collection activities and subsequent versions of the Phase 1a report. This document, therefore, has been revised to address the USEPA's comments to the draft report.

On November 11, 2003, a memorandum describing the proposed scope of work for additional data collection activities in the Phase 1a area was submitted to USEPA. The memorandum proposed the following additional data collection activities in the Phase 1a area: eight off-site soil borings (four at the Terra Pave property and four along Putnam Street), the installation of piezometers at two of the Putnam Street boring locations, and a 12-hour constant rate aquifer test of well OW8. The memorandum also recommended that four on-site borings proposed in the On-Site Soils RI/FS Work Plan (CDM, September 29, 2003) be advanced and sampled early (i.e., prior to initiation of the RI/FS field program). USEPA comments to the memorandum were provided in correspondence dated December 2, 2003.

The proposed additional data collection activities in the Phase 1a area were discussed with USEPA during a kick-off meeting at the Site on September 29, 2003 with the newly-assigned Remedial Project Manager. The work was initiated in late-October 2003 in order perform the work concurrent with the initiation of drilling associated with the On-Site Soils RI/FS field program. The proposed additional data collection included additional sampling from several deep Site soil borings proposed in the USEPA-approved On-Site Soils Work Plan. During March and April 2004, additional background water-level data were also collected from wells OW1, OW1b, OW4a, OW4b, OW7, and OW8 in order to evaluate the typical range in variation in water levels at the site.

Additional semi-annual sampling was also performed during August 2003, February 2004, and August 2004. In addition, as requested by USEPA, an additional deeper well (OW8b) was installed to a depth of in August 2004 in order to evaluate potential impacts to the deeper zone. The results of these additional activities have also been incorporated into this revised report.

Boring/Well Construction Logs for all 11 Omega wells are provided in Appendix A. Electric logs for wells OW4b and OW8b, which were drilled using mud rotary methods, are also provided in Appendix A.

USEPA has also been performing a regional groundwater investigation in areas downgradient of the Site to identify additional sites which may have contributed to groundwater contamination in the area. Phase 1 of the regional groundwater investigation was performed for USEPA by Roy F. Weston, Inc. (Weston) during the period from August 15 through November 2, 2001. The Phase 1 investigation included the analysis of 81 in-situ groundwater samples collected using a push-probe drill rig, temporary well screen, and bailer. In addition, 30 exploratory boring were advanced during the Phase 1 investigation using a cone penetrometer (CPT) drill rig. The results of the Phase 1 investigation were presented in the Phase 1 Groundwater

Characterization Study (Weston, February 2002). Weston also installed and sampled 18 groundwater monitoring wells as part of a subsequent Phase 2 investigation. USEPA also collected split samples for laboratory analysis from all Omega wells during the quarterly and semi-annual sampling events. Sampling of the regional wells is currently being performed for USEPA by CH2MHill.

1.2 Purpose and Objective

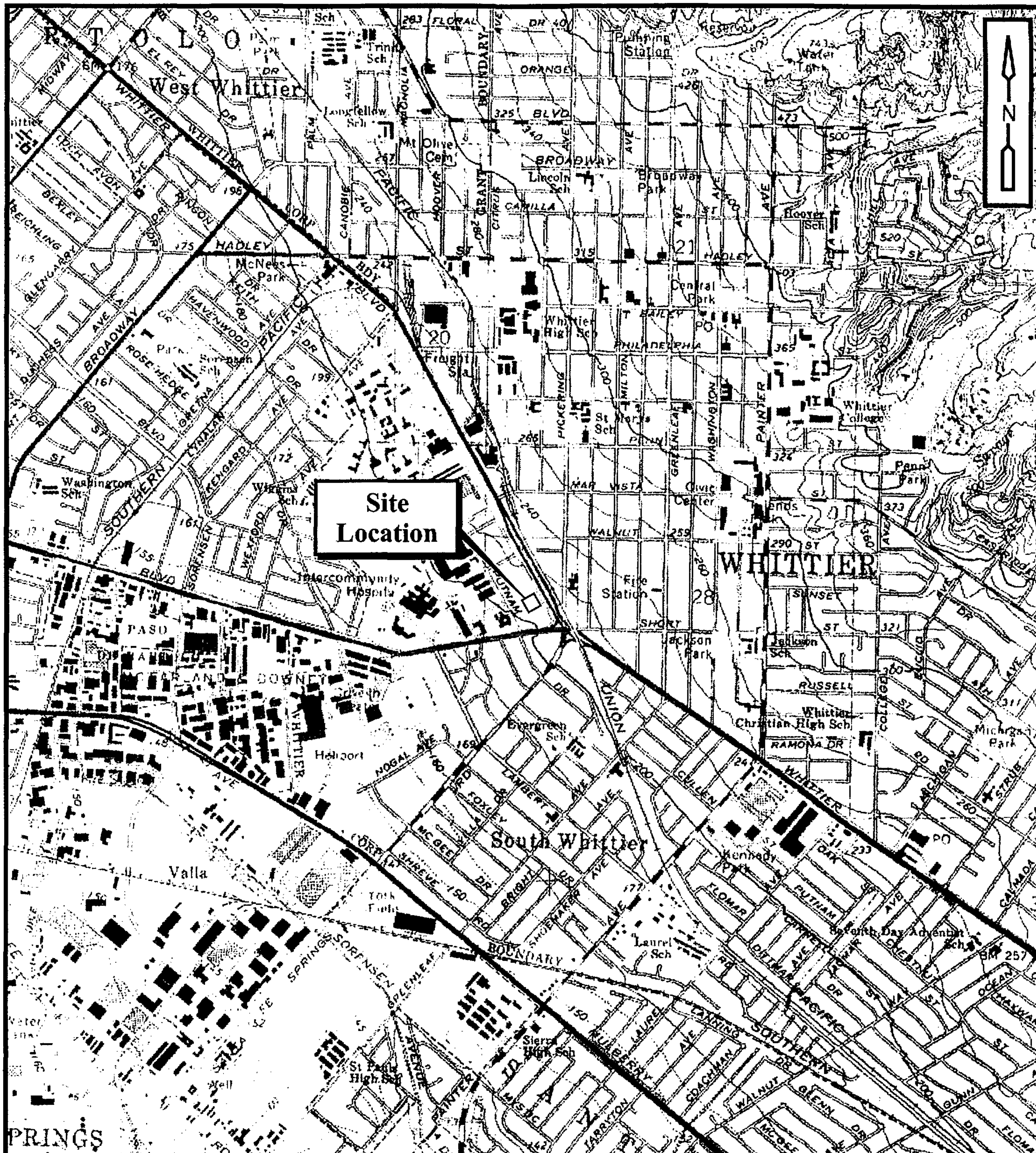
As described above and in accordance with the objectives and scope of work detailed in the Consent Decree, the purpose of the investigation detailed in this Report Addendum was to collect additional data (e.g., lithologic, water quality, aquifer hydraulics, etc.) in order to assist in the selection of the groundwater remedy in the Phase 1a Area. This document summarizes the results of the additional investigation.

1.3 Organization of Report

This report is organized into five sections, as follows:

- Section 1 - Introduction
- Section 2 – Field Procedures
- Section 3 – Data Presentation and Evaluation
- Section 4 – Conclusions and Recommendations
- Section 5 – References
- Appendix A – Boring/Well Construction Logs and Electric Logs
- Appendix B – Completed Field Forms
- Appendix C – Well Survey Data
- Appendix D – Analytical Reports and COCs
- Appendix E – Aquifer Test Data
- Appendix F - Fate and Transport
- Appendix G – Hydrographs and Time-Series Plots
- Appendix H – Data Validation

Figures and tables are provided at the rear of each section where they are first discussed. In response to USEPA's October 15, 2003 comments, detailed cross-sections (Figures 3-22 and 3-23) were developed for this revised report. The Site base map was also revised to more accurately depict the location and configuration of buildings and streets in the surrounding areas. The groundwater elevation contour buildings and streets in the surrounding areas. The groundwater elevation contour maps and all other Section 3 figures have been revised to incorporate the new base map features.



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OMEGA CHEMICAL

Site Location Map

CDM

Figure 1-1

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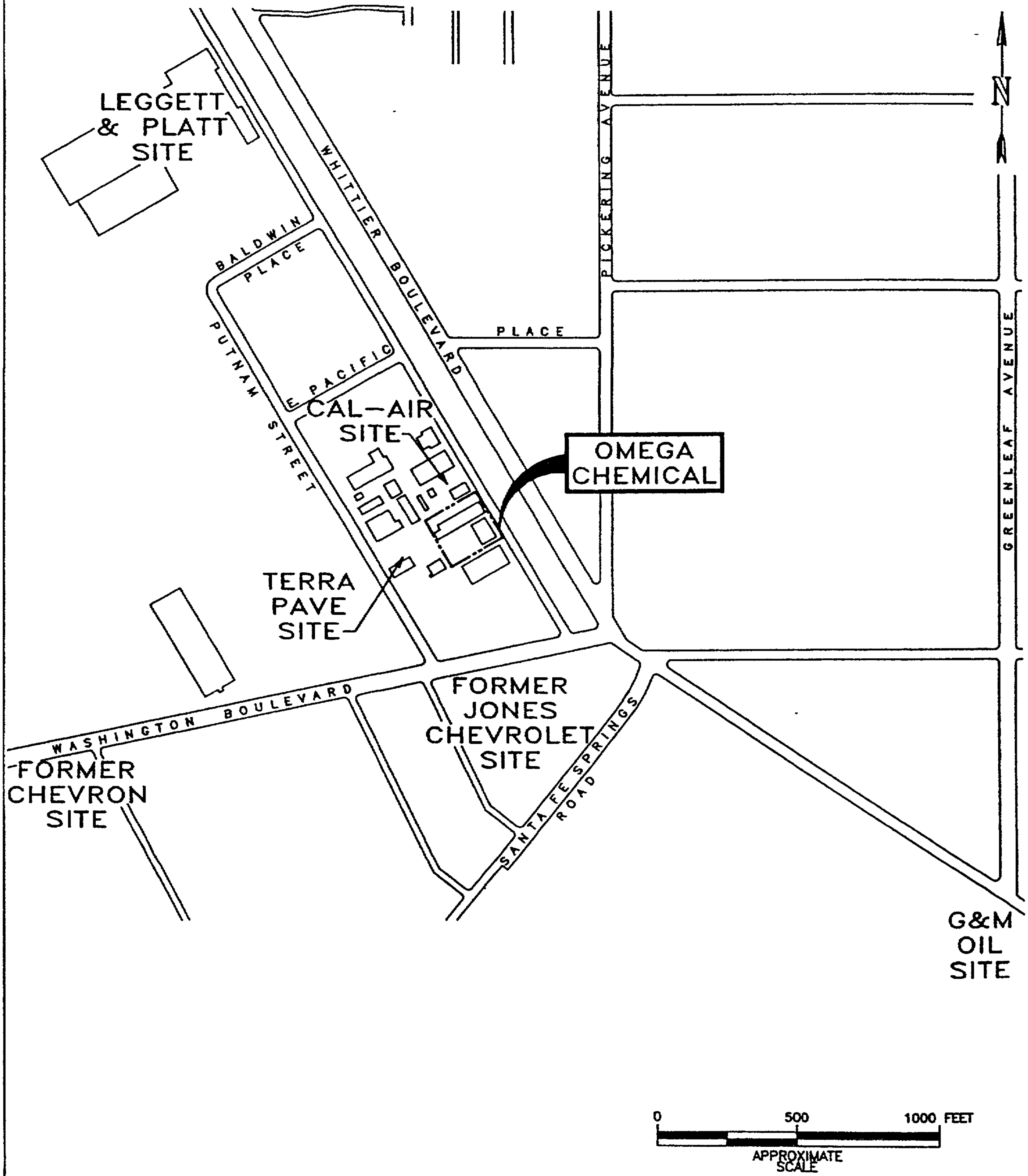

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OMEGA CHEMICAL

VICINITY MAP

CDM
environmental engineers, scientists, planners, & management consultants

Figure 1-2

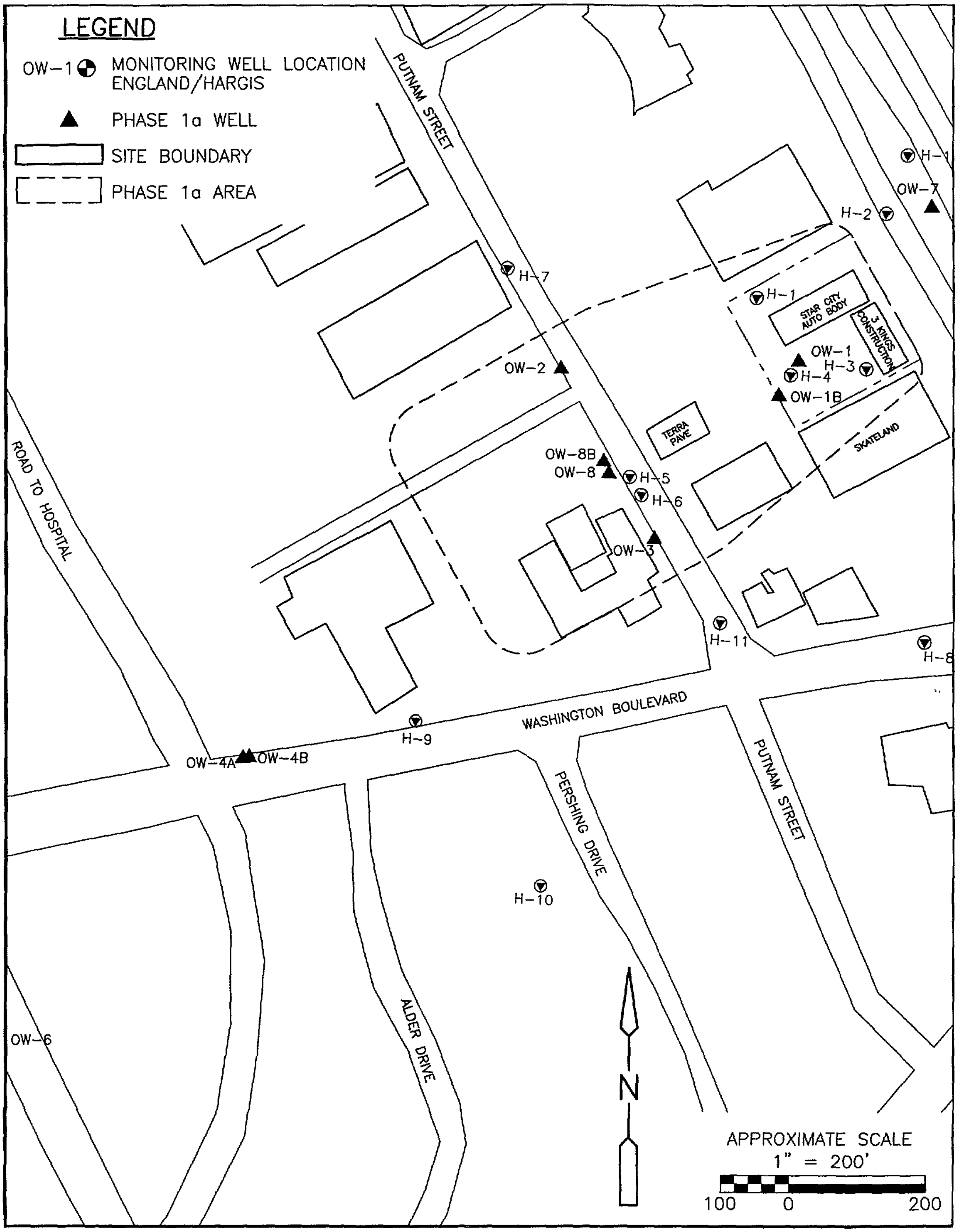

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Figure 1-3
Omega Site
Phase 1a Area

CDM

Section 2
Field Procedures

As discussed in Section 1, two tasks were performed during the initial Phase 1a field investigation in accordance with the SAP Addendum:

- Task 1 - Aquifer Testing and Water Quality Sampling and Analysis

- Task 2 - Semi-Annual Monitoring Well Sampling and Analysis

Additional tasks recommended in the November 11, 2003 memorandum were also performed, as follows (for ease of review, the additional task has been identified as Task 3 in this document):

- Task 3 – Drilling and Soil Sampling

Task 1 above was also expanded per the November 11, 2003 memorandum to include additional longer-term testing of well OW8. A brief discussion of field procedures is provided below.

2.1 Task 1 - Aquifer Testing and Water Quality Sampling and Analysis

Wells OW2, OW3, OW4a and OW8 were tested during the period from March 10 through March 14, 2003 using the single borehole recovery method. An aquifer performance test was conducted by pumping well OW8 and monitoring the response at wells OW1b, OW2, OW3, OW4a, and OW7, and piezometers PZ-1 and PZ-2 between November 19 and November 20, 2003. In addition, water levels were monitored using a pressure transducer during March and April 2004 at wells OW1, OW1b, OW4a, OW4b, OW7 and OW8 to assess background groundwater level fluctuations. Section 2.1.1 provides procedures for aquifer testing, while Section 2.1.2 provides the procedures for the water quality sampling.

2.1.1 Aquifer Testing

2.1.1.1 Single Borehole Tests

A submersible pump was used to perform a 4-hour single borehole aquifer performance test at each of the four well locations, with recovery measured until the water level at each tested well had recovered to within approximately 95 percent of its pre-test static condition.

CDM metered discharge during each test and collected totalizer readings at the beginning and end of the pumping period from an in-line flow meter. Due to some flow adjustments made during testing, a constant discharge rate was difficult to maintain for OW-2, 3, and 4A and totalizer readings were used to estimate the average pumping rate for the entire test period. Therefore, the average pumping rate calculated from the totalizer readings may not reflect the true rate at any specific period during the test. Periodically during pumping, samples of the discharge water were collected for field measurement of pH, temperature, electrical conductivity, and turbidity. Field measurements were recorded on the Aquifer Pump Test Data sheets contained in Appendix B. Equipment decontamination was performed as described in Section 4.8 of the Downgradient Well SAP. The following average pumping rates were determined for each test:

- OW2 - 2.3 gpm
- OW3 - 1.34 gpm
- OW8 – 10.4 gpm
- OW4a - 10.3 gpm

Water levels prior to initiating each test and during the pumping and recovery phases of each test were monitored automatically using a data logger and transducer (In-Situ Mini-Troll™), and confirmed manually using an electric water level indicator. Equipment operation was performed in accordance with manufacturer's instruction manuals. Manual and transducer monitored water levels showed good agreement, so only the transducer data are used in the analysis, since the factory calibrated transducers provide accurate indications of the water level changes. Water levels fluctuations were minor and showed no significant trend so no corrections were applied to the data. Manual water level readings were generally collected on a typical logarithmic progression (e.g., every minute during the first ten minutes of the test, every two minutes from 10 to 20 minutes into the test, every 5 minutes from 20 to 30 minutes into the test, every 10 minutes from 30 to 60 minutes into the test, etc.). The data logger also collected water level measurements using its pre-set logarithmic progression. Manual measurements are provided on the field forms contained in Appendix B.

A total of 6,326 gallons of water were generated during the four tests. The water was pumped directly into a vacuum truck. Upon the completion of testing at each location, the purge water was transported under non-hazardous waste manifest to the Demenno/Kerdoon (DK) facility in Compton, California for recycling. Because well purge water from previous sampling events in 2001, 2002, and 2003 had also been recycled by the DK facility, a disposal profile had been established for the water and further analysis was not required prior to disposal.

2.1.1.2 Aquifer Performance Test

A multi-well aquifer performance test was conducted between November 19 and 20, 2003 by pumping well OW8 and monitoring water levels at wells OW1b, OW2, OW3, OW4a, and OW7, and piezometers PZ-1 and PZ-2. The aquifer pumping test was preceded by short term pumping to verify long term rates and to test equipment.

A submersible pump was used for all pumping of OW8. Flow at OW8 was monitored using an in-line flow meter with a totalizer. The flow rate was monitored and adjusted during the early part of the test to a nominal 11 gpm. Pumping rates did fluctuate during the first 2 hours of the test to rates as low as 5 gpm for short periods. Flow rates remained stable till near the end of the test, when a 90 second shutdown occurred during refueling of the generator. A total of 12,973 gallons of water were pumped over 1,184 minutes (19.73 hours), resulting in an average flow rate of 10.96 gpm. Owing to the presence of various organic compounds in the discharge water, it was necessary to containerize the pumped water in a portable tank for disposal at an off-site facility.

Water levels were monitored prior to testing, in addition to during the pumping and recovery periods at the noted wells using pressure transducers and data loggers. Initial settings for transducers were based on manual water level measurements. All analyses were conducted using the transducer readings. Water levels prior to the test varied only within a few hundredths of a foot, so no corrections were applied to the data. Additional monitoring was conducted during winter 2004 at several wells on site to assess the range in variation in water levels typical at the site.

2.1.2 Water Quality Sampling and Analysis

Water quality samples were collected from each pumped well just before the termination of pumping. One sample was collected from each well and submitted for analysis of the following parameters on a standard turnaround basis:

- VOCs plus acetone, Freon 11, Freon 12, Freon 113, MTBE (methyl-tertiary-butyl-ether) and Tentatively Identified Compounds (TICs) by Method 8260B
- 1,4-Dioxane by Method 8270M

The discharge rate was slowed to less than one gpm during sample collection. The sample containers were filled directly from the end of the discharge pipe. One sequential duplicate sample was also collected from well OW8 during the March 2003 testing. Sample collection and handling was performed as described in the following section. Analytical reports and completed COC forms for analytical samples collected during aquifer testing are contained in Appendix D.

2.2 Semi-Annual Monitoring Well Sampling and Analysis

In accordance with the SAP Addendum, all Omega wells will be sampled on a semi-annual basis until the Phase 1a Area treatment plant is operational. As previously discussed, semi-annual sampling was initiated during mid-August 2002. To date, five semi-annual sampling events have been completed (mid-August 2002, mid-February 2003, mid-August 2003, mid-February 2004, and mid-August 2004). Groundwater samples collected from the Omega wells and duplicates were analyzed for the following parameters at a fixed-base laboratory during the five semi-annual sampling events performed to date:

- VOCs plus acetone, Freon 11, Freon 12, Freon 113, MTBE (methyl-tertiary-butyl-ether) and Tentatively Identified Compounds (TICs) by Method 8260B

In addition, groundwater samples collected from selected wells (OW1, OW1b, OW2, OW3, OW4a, OW4b, and OW8) were analyzed for 1,4-dioxane by Method 8270M during the mid-August 2002 and mid-February 2003 sampling events. During the three most recent sampling events (mid-August 2003 through mid-August 2004), samples for 1,4-dioxane analysis were collected from all Omega wells.

In accordance with Section 2.2 of the SAP Addendum and as described below, all wells were purged using a portable submersible pump and dedicated polyethylene tubing. Purge volume was determined by measuring the water level and bottom of each well, and then calculating three saturated casing volumes. The amount of water contained in the gravel pack was also estimated, multiplied by three, and added to the purge volume. At locations where the well pumped dry (i.e., OW1 and OW1b), the well was sampled later that day or early the next morning following water level recovery.

As previously described in Section 2.1.1, samples of the discharge water were collected periodically for field measurement of pH, temperature, electrical conductivity, and turbidity. Upon the completion of purging, with the exception of samples for VOC and 1,4-dioxane analyses, the discharge rate was lowered to less than 1 gpm and sample containers were filled directly from the end of the discharge tubing. The portable pump was then removed from each well and a pre-cleaned, disposable bailer lowered to the approximate middle of the perforated section was used to collect samples for VOC and 1,4-dioxane analyses. The sample containers were filled pouring directly from the top of the bailer, exercising care to minimize agitation.

Field measurements for all semi-annual sampling events are indicated on the Monitoring Well Purge and Sampling forms contained in Appendix B. Analytical reports and completed COC forms for analytical samples collected during the semi-annual sampling events are contained in Appendix D.

As indicated in the Technical Memorandum (OPOG, October 31, 2001), additional analyses for biodegradation/natural attenuation parameters and emerging compounds were also performed on groundwater samples collected from selected wells (OW1, OW1b, OW2, OW3, OW4a, OW4b and OW8) during the February 2003 semi-annual sampling event. Analyses of the field parameters listed below were performed in accordance with manufacturer's directions provided with each Direct Reading Instrument (DRI) and Hach Test Kit.

Biodegradation/Natural Attenuation Field Parameters
The following biodegradation/natural attenuation parameters were analyzed immediately in the field:

- Dissolved Oxygen (DO) *
- Redox (Eh) *
- Sulfate **
- Iron (II) **
- Alkalinity **
- Chloride **
- Hydrogen Sulfide **
- Carbon Dioxide **

* Indicates field analysis using a DRI (Orion 250A for Eh and YSI 55 for DO) .
** Indicates field analysis performed per manufacturer's instructions using a Hach Company (Loveland, Colorado) test kit.

Biodegradation/Natural Attenuation Analytical Parameters (fixed-base laboratory)
The following parameters were analyzed by a fixed-base laboratory:

- Nitrate/Nitrite (Method 300.0)
- Dissolved Organic Carbon (DOC, Method 415.1)
- Methane/Ethane/Ethene (if field tests indicated conditions were anaerobic) (Methane by Method AM20GAX and Ethane/Ethene by Method AM18)

Sample handling was performed as indicated in Section 3 (Table 3-1) of the SAP Addendum. Laboratory samples for dissolved organic carbon analysis were collected in un-acidified containers, and filtering by the lab was indicated on the Chain of Custody (COC) form. Field personnel coordinated with the analytical laboratory to make sure that analyses with short holding times (e.g., nitrate/nitrite and hexavalent chromium) were analyzed within the required holding time.

In accordance with the SAP Addendum, bottles were filled for methane/ethane/ethene analyses and stored in an iced cooler pending evaluation of the dissolved oxygen measurements and ferrous iron (Fe II) field analytical results for the sampled wells. According to the SAP Addendum, in the event that anaerobic conditions were observed at a sampled well location (e.g., ferrous iron was detected during field testing and DO measurements were less than 1 mg/L), the bottles filled for methane/ethane/ethene analyses were to be submitted to the fixed-base laboratory for analysis. Methane/ethane/ethane are metabolic byproducts produced only under reduced, anaerobic environments. Methane is produced through carbon dioxide reduction and/or fermentation reactions, while ethane and ethane are innocuous end-products that result from the reductive dechlorination of chlorinated VOCs. In the absence of anaerobic conditions, methane/ethane/ethene generation is likely be insignificant, therefore, analysis for these compounds was unwarranted. Based on evaluation of the field results, three samples (OW1, OW1b, and OW8) were selected for methane/ethane/ethene analyses.

Emerging Compounds (fixed-base laboratory)
The following additional parameters were also analyzed by a fixed-base laboratory:

- Hexavalent Chromium (Method 218.6)
- 1,4-Dioxane (Method 8270C)
- Perchlorate (Method 314.0)

Well Purging and Sampling Procedures
Each well was purged using a portable submersible pump and dedicated polyethylene tubing previously installed inside each Omega well. Upon the completion of purging, with the exception of samples for VOC and 1,4-dioxane analysis, all sample containers were filled directly from the end of the discharge tubing, with the discharge rate lowered to less than one gpm during filling of the sample containers.

Upon the completion of sample collection using the submersible pump, the pump was removed from the well and a pre-cleaned, disposable bailer lowered to the approximate middle of the perforated section. The bailer was used to collect samples for VOCs and 1,4-dioxane analyses. The groundwater contained in the bailer was poured directly into the sample containers, minimizing agitation. After sampling was completed, the bailer and line were discarded.

All samples were submitted for standard analytical turnaround time. Level 4 deliverables were requested on approximately 10 percent of the samples submitted for fixed-base laboratory analysis during each sampling event, in order to perform formal validation of the data. Data validation results are discussed in Section 3.6. The laboratory provided both electronic and hard copy reports.

Water Level Measurements
Water level measurements were also collected from the Omega wells prior to each sampling event. Water level measurements and water quality sampling activities were performed in accordance with the procedures specified in Sections 2.1.4 and 2.1.5 of the Downgradient Well SAP, respectively.

2.3 Drilling and Soil Sampling

Eight borings (GP1 through GP8) were advanced and sampled during October 2003 and January 2004 using the direct-push drilling method. Borings GP1, GP2, GP3, and GP6 were located on the Omega site, with borings GP5, GP5, GP7, and GP8 located on the adjacent Terra Pave property (direct-push boring locations are illustrated on Figure 3-21).

A specialized down-hole tool (Membrane Interface Probe [MIP]) was utilized at three of the boring locations (GP4 through GP6) to collect continuous total VOC screening information during drilling. The MIP screening results (see Appendix A) were used to select 3 to 4 soil samples per boring for laboratory analysis of VOCs. A fourth location (GP3) was originally proposed for MIP screening. During drilling at the location of GP3 (former 500 gallon kerosene UST), however, gravel backfill was encountered to a depth of 7 feet bgs. The boring was subsequently advanced to 35 feet bgs but had to be abandoned due to gravel falling down the boring which prevented advancing the boring below 35 feet bgs. The replacement boring (GP3A) was relocated a short distance to the south of the former UST location. Due to indications of contamination (i.e., odor) noted at location GP3, it was determined in the field to forego MIP screening at location GP3A and instead collect additional soil samples for VOC and 1,4-dioxane analyses. A total of eight soil samples were subsequently collected for laboratory analyses at approximate 10-foot intervals in the interval from 10 to 85 feet bgs.

Four borings (B1 through B4) were advanced along Putnam Street during November 2003 using the sonic drilling method. Each boring was continuously cored for lithologic description purposes. Two of the borings (B1 and B2) were converted to 2-inch diameter piezometers (PZ1 and PZ2, respectively).

Well OW8b was installed on Putnam Street during August 2004 using the direct mud rotary drilling method. During drilling, soil cuttings were collected from the drilling fluid and logged. Electric-logging (16 and 64-inch resistivity, 6-foot lateral resistivity, point, spontaneous potential, and gamma) was also performed in the boring after it had been advanced to its maximum depth (143 feet bgs). Following evaluation of the lithologic and geophysical logs, the well was installed and completed to a depth of 126 feet bgs.

Boring and well locations are illustrated on Figure 3-21. Boring logs, well and piezometer completion details, and geophysical logs are provided in Appendix A. Survey results (wellhead location coordinates and elevation) for new well OW8b, new piezometers PZ1 and PZ2, and all other Omega wells is provided in Appendix C.

Section 3
Data Presentation and Evaluation

As previously discussed, wells OW7 and OW8 were installed in March 2002, with well OW8b installed in August 2004. These wells yielded additional information regarding subsurface conditions at the two locations presently being evaluated for extraction of impacted groundwater. In addition, during the period from May 2001 through February 2003, water level measurements were collected from Omega wells monthly for one year and then semi-annually for a year, totaling 17 separate events. Monitoring well locations are illustrated on Figure 3-1, with groundwater elevation contours for the 17 water level monitoring events illustrated on Figures 3-2 through 3-18. Selected VOC results and emerging compound results are illustrated on Figures 3-19 and 3-20, respectively.

Two piezometers (PZ1 and PZ2) were installed as observation points for the aquifer test using sonic drilling methods with continuous core retrieval. A deep zone well (OW8b) was installed adjacent to OW8 to evaluate the degree of hydraulic connection and relative contaminant concentrations between the two zones.

Well construction information has been summarized in Table 3-1, with water level measurements and groundwater elevation summarized in Table 3-2. Analytical results for all groundwater sampling events were input into the project's Access™ database, with analytical results summarized in Tables 3-3 through 3-8. Biodegradation/natural attenuation field results are summarized in Table 3-9. Soil sample analytical results are summarized on Table 3-10.

As previously discussed, the historical base map used to illustrate the groundwater elevation contours and other figures has been revised to more accurately depict the location and configuration of buildings and streets in the surrounding areas. The new basemap was developed using one-foot resolution orthonormalized and georeferenced aerial photography from the United States Geological Survey (USGS). Features including streets and building footprints were digitized from this orthophoto coverage to create basemap features. All maps and photos were maintained in NAD83 state plane coordinates. Wells and borings or other sample locations with survey, GPS or digitized coordinates in various projections were converted to NAD83 for plotting on the basemap.

3.1 Lithologic Data

The subsurface lithology at the location of new well OW7 is very similar to the lithology at locations OW1 and OW1b. As indicated on the lithologic logs contained in Appendix A, the subsurface materials at location OW7 consist primarily of clays and silty clays. The subsurface materials at the location of new well OW8 are comparable to the materials observed at locations OW2 and OW3, with silts and clays observed to an approximate depth of 54 feet below ground surface (bgs) and sand observed in the interval from 54 to 79 feet bgs. The subsurface materials adjacent to the screened interval of well OW8 are slightly coarser-grained (very fine to coarse sands) than the subsurface materials adjacent to the screened interval of well OW2 (very fine to fine sands).

Additional lithologic data along Putnam Street obtained from piezometers PZ1, PZ2 and well OW8 indicate that the uppermost aquifer in this area is comprised of sand, silty sand and well graded gravel containing significant silt. The aquifer is interbedded, and in the area between PZ1 and PZ2 contains a finer grain interval separating the upper and lower portion of the aquifer. The deep well (OW8b) indicates that a 26 foot thick clay separates the upper aquifer from the next deeper sandy interval that was screened in this well. This unit may correlate with the low permeability unit separating the Gage and Jefferson aquifers, however, the nearest regional cross-section in Bulletin 104 suggests that this intervening unit is somewhat thicker.

The subsurface materials adjacent to the screened interval of well OW4a are generally coarser-grained (fine to coarse sands with some gravel), and consist of sands and silty sands interbedded with clays and silty clays. Due to flowing sands encountered at location OW4, the deeper well (OW4b) was drilled using the mud rotary drilling method vs. the hollow-stem auger method used to drill and install the other 9 Omega wells. An electric log was performed in the OW4b boring and is included in Appendix A. The electric log correlates well with the lithologic logs at location OW4.

Detailed geologic cross-sections were constructed approximately along the groundwater flow direction and orthogonal to this flow direction along Putnam Street. Figure 3-21 shows the plan view location of these cross-sections. Cross-section A-A′ (Figure 3-22) extends along an approximate groundwater flow line extending from OW7, upgradient of the site, to OW4 downgradient of the site. Shallow deposits in the vadose zone consist primarily of silt and clay deposits. This section illustrates the presence of the two aquifer zones present at the site, separated by a low permeability confining zone. The upper aquifer zone appears to 'pinch out' in the area upgradient (east) of Putnam Street. A relatively thick sand sequence is observed at OW4 and OW8, that thins dramatically at borings GP-7 and GP-1. This sandy zone is absent at boring GP-2. The deeper sand zone is only observed at locations OW4 and OW8, which extended to a sufficient depth. Well OW1b extended to a similar depth, however, sandy lithologies were not encountered at this boring. Based on water levels at the OW4 and OW8 locations, where both deep and shallow zone completions are available, the groundwater elevations are significantly higher in the shallow aquifer. A similar difference in water level, with an indicated downward gradient was observed at the cluster at OW1/1b. This indicates that a significant confining zone limits flow between these zones. This issue will be discussed further in Section 3.3.1. An additional cross-section , B – B′, (Figure 3-23) was prepared extending from OW-8B through H-3, including wells OW-1 and OW-1B. This section also indicates that the upper zone pinches out. Well OW-1B was drilled to approximately elevation 70 ft MSL and encountered only clayey lithologies. The interval in the sensing zone for this well does have small percentages of gravel interspersed in a clay matrix near the bottom of the well, however, the small percentage of coarser material will not significantly increase the permeability of this unit. This is a similar elevation as the deeper aquifer encountered at OW-8B, which is screened from elevation 75 to 85 ft MSL in a well sorted fine to medium sand. Well OW-1B has a sensing zone that likely intersects the uppermost portion of the same interval intersected at OW-8B, implying that this deeper zone pinches out in a manner similar to the upper aquifer zone, or, if the deeper aquifer is present, it occurs at a greater depth. USEPA is currently installing additional wells to define groundwater flow directions in the site vicinity. If these additional wells indicate that well OW-8B is downgradient of the site, then no further investigation of the potential for a deeper aquifer zone at the site is warranted, since OW-8B does not indicate the presence of high levels of contamination.

An additional cross-section was constructed approximately along Putnam Street, at a right angle to the general flow direction. Cross-section C-C′ (Figure 3-24) incorporates boring logs available in USEPA files for other sites. This section indicates that the shallow aquifer may pinch out to the north, since it was not encountered in borings north of H-7. The shallow aquifer configuration shows the presence of a lower permeability zone splitting the upper aquifer north of PZ1. Boring B-4 indicates a thick sand sequence suggesting that the lower permeability split was eroded, or never deposited, resulting in good hydraulic connection within the upper aquifer at this location. The uppermost sand unit within the upper aquifer appears continuous below the water table elevation from H-7 at the northern end to B-3 at the southern end of the section. A clayey gravel is present at a similar depth in OW3 that is also part of this unit, however the presence of the clay matrix is likely to diminish the hydraulic conductivity of the unit. The cross section shows a clay unit at OW-3 overlying this clayey gravel interval. The sand thickness increases, and interbedded clays are absent at boring H-11, near Washington Street. The presence of possible multiple channel units with intervening clays appears to have localized transport of the VOC plume at the site to the area centered around OW-8.

Figure 3-25 provides a three-dimensional view of the distribution of lithologies at the site. A column representing each boring location is color-coded to indicate the relative permeability of lithologies encountered at each location. A three-tiered classification system was used on this figure, with the yellow zones indicating intervals with the highest relative hydraulic conductivity, orange indicating intermediate values and blue indicating intervals with the lowest relative hydraulic conductivity. The highest relative hydraulic conductivity class was assigned to deposits that consisted primarily of sand or gravel, with limited silt and clay content. The intermediate hydraulic conductivity class was assigned to lithologies that included primarily sand or gravel, but with significant silt or clay, which will lower the hydraulic conductivity. The lowest hydraulic conductivity class was assigned to intervals that were primarily silt or clay. This figure illustrates the limited areal extent of the upper aquifer east of Putnam near the presumed source area. Boring logs along Putnam Street and downgradient show significant high and intermediate hydraulic conductivity material is present that pinches out to the east of Putnam Street. The upper aquifer zone comprises a channel-like feature extending from near Putnam Street, toward the west. Information on the deeper aquifer is more limited, with only three wells extending to a sufficient depth. Based on this limited information, a similar trend occurs near the Omega site east of Putnam Street, where sandy intervals are very limited.

Regional hydrogeologic information is inconclusive on the presence or absence of major regional named aquifers in this portion of the Whittier Area. A cross-section about 1.5 miles south of the site is presented in Bulletin 104 (DWR, 1961) that suggests that the uppermost aquifers present are the Gage and Jefferson Aquifers. The upper aquifer at the site may represent the Gage aquifer, while the lower aquifer is potentially the Jefferson aquifer.

3.2 Water Level and Groundwater Elevation Results

All Omega wells were surveyed and groundwater elevation calculated at each location using the water level measurements for each well. Groundwater elevation results are summarized in Table 3-2. As indicated on the groundwater elevation contour maps (Figures 3-2 through 3-18), the direction of groundwater flow in the upper aquifer was consistently towards the southwest during all 17 water level monitoring events. Insufficient water level data are available in the lower aquifer to define the groundwater flow direction. As directed by USEPA, OSVOG (Omega Small Volume Group), is currently proposing to install additional shallow and deep wells in the area downgradient of the Site. These wells will allow better definition of flow pathways in both the shallow and deeper aquifer zones.

There is a noticeable change in hydraulic gradient in the vicinity of Washington Boulevard and the OW-4 monitoring well cluster, which corresponds to the observed transition from finer-grained subsurface lithology in the area northeast of Washington Boulevard to coarser-grained subsurface lithology in the area southwest of Washington Boulevard. During the August 2004 sampling event, hydraulic gradient upgradient of cluster well OW-4 was approximately 0.01 ft/ft, and downgradient of cluster well OW-4 it was approximately 0.003 ft/ft. A similar trend was observed during the August 2001 sampling event, with a hydraulic gradient of approximately 0.01 ft/ft upgradient of cluster well OW4 and 0.002 ft/ft downgradient of cluster well OW-4.

As indicated by review of the hydrographs provided in Appendix G, water levels have generally been declining throughout most of the monitored period (May 2001 through August 2004). During the monthly monitoring that occurred during mid-2001 to mid-2002, water levels were generally slightly higher during spring and summer months, and slightly lower during fall and winter months.

As observed at the three locations where shallow and deeper well pairs (OW1, OW4 and OW8) are present, groundwater elevations in the deeper wells were consistently deeper than the elevations observed at the shallow wells at those locations. Appendix G presents each of these paired wells on the same figure to allow comparisons between the well pairs. Also, as water levels have dropped over time in wells OW1/

OW1b and OW4a/ OW4b, the differences in head between the monitored zones have increased at both locations. For example, at OW1/OW1b during May 2001, the head difference between the two zones was 3.43 feet. During the August 2004 sampling event, the head difference between the two wells was 9.28 feet. The well pair at OW4a/OW4b exhibited a similar trend, with a head difference of 3.76 feet in May 2001 and 8.99 feet in August 2004. The difference in head at location OW8/OW8b during August 2004 was 17.4 feet. The August 2004 sampling event was the initial sampling of newly-installed well OW8b. Subsequent sampling at OW8/OW8b will allow for additional evaluation of head differences at that location. The most recent measurements, taken in February, 2005, show in increase in water level in the deeper zone monitoring wells that decreased the head difference between the upper and lower aquifers. The vertical gradient remained downward.

This head difference suggests that significant hydraulic separation exists between the shallow and deeper screened zones. The head differences also indicate a downward hydraulic gradient at these locations, suggesting that there is the potential for contaminants to migrate downward towards the deeper zone. Water quality results from the three well pair locations support the assumption that hydraulic separation between the two zones limits downward vertical migration.

3.3 Quarterly and Semi-Annual Groundwater Sampling Analytical Results

As discussed previously, water quality samples were collected quarterly from all Omega wells for one year starting mid-May 2001 and ending mid-February 2002. In addition, samples were collected on a semi-annual basis starting in mid-August 2002. Semi-annual sampling is currently on-going. Analytical results for all detected compounds (laboratory and field) are summarized in Tables 3-3 through 3-9.

The following discussion of groundwater sample analytical results is limited to samples collected from wells in the Phase 1a area (OW1, OW1b, OW2, OW3, OW8, and OW8b), along Washington Boulevard (OW4a and OW4b), and the well directly upgradient from the Omega facility (OW7). Screened intervals for each well are indicated on the majority of the analytical summary tables. The results of routine groundwater sampling performed since May 2001 are discussed below.

Time-series plots for six selected compounds (PCE, TCE, Freon 11, Freon 113, 1,1-DCE, and 1,4-dioxane) were prepared to illustrate concentration changes over time. Two sets of graphs were prepared, with one set of graphs showing each individual compound in all eight wells, and the second set illustrating the concentrations over time of the six compounds on a per well basis. Both sets of graphs are provided in Appendix G.

3.3.1 Chlorinated VOCs

Chlorinated VOCs have been detected more frequently and at elevated concentrations in the Phase 1a area, therefore, they are the primary compounds of concern at the Site.

The following discussion regarding chlorinated VOCs is based on well location with respect to distance from the assumed on-site source area, and depth (see Table 3-1 for well construction information and screened intervals). As shown on Figure 3-1, wells OW1 and OW1b are located at or in close proximity to the Site and are considered source area wells. Putnam Street wells OW2, OW3, OW8, and OW8b are located a short distance (e.g., approximately 300 feet) downgradient from the Site. As discussed previously, these six wells are located within the Phase 1a study area. Wells OW4a and OW4b are located on Washington Boulevard approximately 1,000 feet downgradient from the Site. At the three locations where a deeper well is paired with a water table well (OW1 and OW1b, OW4a and OW4b, and OW8 and OW8b), the vertical extent of chlorinated VOCs is discussed.

Source Area Wells OW1 and Ow1b

Well OW1 is a water table well (screened from 62.5 to 77.5 feet bgs) located on-site and is considered a source area well. Well OW1b (screened from 110 to 120 feet bgs) is a deeper well located on the adjacent Terra Pave property, and paired with well OW1 provides information on the vertical extent of chlorinated VOCs in the general area of the assumed source.

The compound detected at the highest concentration in well OW1 during the quarterly and semi-annual sampling events was tetrachloroethene (PCE), which was detected at concentrations ranging from 30,000 micrograms per liter (ug/l) in February 2002 to 150,000 ug/l in February 2004 and August 2004 (based on the duplicate sample result). TCE was also detected in well OW1 at concentrations ranging from 12,000 ug/l (June 1996 and August 2004) to 2,100 ug/l (July 1999).

Other chlorinated VOCs detected at elevated concentrations included 1,1,1-trichloroethane (1,1,1-TCA) at a maximum concentration of 12,000 ug/l in August 2004 (based on duplicate sample result); 1,1-dichloroethene (1,1-DCE) at a maximum concentration of 2,700 ug/l in May 2001; chloroform (CFM) at a maximum concentration of 500 ug/l in May 2001 and February 2003; and methylene chloride (MC) at a maximum concentration of 490 ug/l in May 2001. During the previous four semi-annual sampling events, MC concentrations in the well have ranged from 72 to 41 ug/l. Freon concentrations in well OW1 appear to be declining over time, from a high of 1,400 ug/l (Freon 113) during August and November 2001 to 150 ug/l in August 2004 (based on the duplicate sample result). Freon 11 has exhibited a similar trend over the same time period.

Chlorinated VOCs were generally not detected in near-site deeper well OW1b. The primary exception was PCE, which was detected at concentrations several orders-of-magnitude lower in well OW1b compared to well OW1. The concentration of PCE in well OW1b ranged from 110 µg/L in August 2003 to 28 ug/l in February 2002. These data indicate that chlorinated VOC concentrations decline with increased depth and appear to be of limited vertical extent.

Putnam Street Wells OW2, OW3, OW8, and OW8b

Chlorinated VOCs were detected in water table wells OW2 ,OW3, OW8, and OW8b located approximately 300 feet downgradient from the Site along Putnam Street. Based on evaluation of the analytical results, the following general observations were made regarding the concentrations of chlorinated VOCS in the four wells.

Chlorinated VOC concentrations in the three Putnam Street wells were less than those observed in the on-site source area well (OW1). For example, PCE was detected at a concentration of 13,000 ug/l in well OW8 in February 2003, compared to a concentration of 100,000 ug/l detected in on-site source area well OW1 during February 2003.

The concentrations observed in wells OW2 and OW3 were generally comparable to each other. PCE concentrations in wells OW2 and OW3 during quarterly and semi-annual sampling ranged from 610 to 2,800 ug/l and from 200 to 3,200 ug/l (in the duplicate sample collected February 2004), respectively. As indicated on the time-series plot for well OW2, the concentration of PCE has been steadily increasing in the well since August 2002.

TCE concentrations in wells OW2 and OW3 ranged from 110 to 300 ug/l and 160 to 290 ug/l (in the duplicate sample collected February 2004), respectively. Maximum concentrations of other chlorinated VOCs detected in well OW2 were 1,000 ug/l 1,1-DCE; 1,600 ug/l Freon 113; and 390 ug/l Freon 11. Maximum concentrations of other chlorinated VOCs detected in well OW3 were 1,700 ug/l 1,1,-DCE; 530 ug/l Freon 113; and 380 ug/l Freon 11. Freon concentrations in the two wells appear to be slowly declining over time.

In comparison, the concentrations of chlorinated VOCs detected in well OW8 were generally higher than the concentrations detected in wells OW2 and OW3. This suggests that the area transmitting most of the contaminant mass is relatively narrow and centered in the area of OW-8. Maximum concentrations of PCE, TCE, 1,1,-DCE, Freon 113 and Freon 11 detected in groundwater samples collected from well OW8 were 36,000 ug/l; 2,20ug/l; 2,600 ug/l; 2,800 ug/l and 1,000 ug/l, respectively. In addition, MC and CFM were detected at maximum concentrations of 6,500 ug/l and 2,000 ug/l, respectively, in groundwater samples collected from well OW8. By comparison, MC and CFM were detected either at low concentrations or were not detected in samples collected from wells OW2 and OW3.

At location OW8, MC and CFM concentrations increased from the initial quarterly sampling event in March 2002 (36 and 390 ug/l, respectively) to the most recent semi-annual sampling event in August 2004 (1,700 and 6,300 ug/l, respectively). The concentration of MC detected in well OW8 during the February 2003 sampling event (930 ug/l) was higher than the concentration (72 ug/l) detected in on-site source area well OW1. The concentrations of Freon 113 and Freon 11 were also higher in well OW8 in comparison to the concentrations reported for well OW1. This trend was also observed during all subsequent semi-annual sampling events.

Newly-installed deeper well OW8b was sampled for the first time during the August 2004 sampling event. A low concentration of 2.1 ug/l PCE was detected in the well, and all other VOCs and 1,4-dioxane were non-detect. As discussed in Section 3.3.4, elevated concentrations of several VOCs and 1,4-dioxane were detected in groundwater samples collected from the shallow well (OW8) at this location. The observed water quality differences between wells OW8 and OW8b provide additional support for a significant confining zone that limits flow between these zones.

Washington Boulevard Wells OW4a and OW4b
Chlorinated VOCs were detected in Washington Boulevard water table well OW4a located approximately 1,000 feet downgradient from the Site. Concentrations were generally several orders of magnitude less than concentrations observed in the on-site source area well (OW1), and several times less than concentrations observed in Putnam Street wells OW2 and OW3. Chlorinated VOC concentrations, therefore, were observed to decrease with increased distance downgradient from the source area.

The compound MC, which was detected at elevated concentrations in the groundwater samples collected from well OW8, was not detected in the samples collected from well OW4a at a detection limit of 5 ug/l. During the most recent sampling event in August 2004, an estimated concentration (i.e., below the reporting limit) of 1.1 ug/l was detected in the well. In addition, the concentration of CFM was several orders of magnitude lower in the samples collected from well OW4a in comparison with the concentration detected in samples collected from well OW8.

Low concentrations of chlorinated VOCs (e.g., 1.2 to 41 ug/l PCE) were generally detected in groundwater samples collected from deeper well OW4b during the quarterly and semi-annual sampling events. As discussed previously, well OW4b is located adjacent to well OW4a. For reference, well OW4a is screened from 49.8 feet to 69.8 bgs, with well OW4b screened from 112 to 122.3 feet bgs. During the two semi-annual sampling events in August 2002 and February 2003, PCE was detected at increased concentrations of 12 and 41 ug/l, respectively. During the August 2003 through August 2004 semi-annual sampling events, PCE decreased to 1.6 ug/l in well OW4b.

In addition, several additional compounds (TCE, 1,1-DCE, Freon 113 and Freon 11) were also detected in groundwater samples collected from well OW4b. As was observed at the source area well pair location (OW1/OW1b), the data for the downgradient well pair (OW4a/OW4b) demonstrate that chlorinated VOC concentrations decline with increased depth and appear to be of limited vertical extent.

Upgradient Well OW7
Several chlorinated VOCs were detected at low concentrations at the upgradient well (OW7) location. Maximum concentrations of 20 ug/l PCE, 2 ug/l TCE, 63 ug/l Freon 113, and 54 ug/l Freon 11 were detected in the upgradient well. Land use upgradient from OW7 is primarily commercial and residential. The source of this observed

contamination is unknown, however, it is likely indicative of regional contamination in areas upgradient of the Site.

3.3.2 Aromatic VOCs

Several aromatic organics have historically been detected at relatively low concentrations in on-site source area well OW1 (see Table 3-4). During the most recent August 2004 semi-annual sampling event, aromatic compounds were detected at concentrations comparable to the prior sampling events. During the August 2004 sampling event, the following aromatics were detected in groundwater samples collected from on-site source area well OW1: benzene at 7 ug/l, toluene at 9.6 ug/l, ethylbenzene at 3.1 ug/l, total xylenes at 0.55 ug/l, and isopropylbenzene at 1.5 ug/l. Historically, with the exception of sporadic low-level detections close to or below the reporting limit, aromatic organics have not been detected in deeper well OW1b. With one minor exception (acetone at an estimated [i.e., below the reporting limit] concentration of 6.1 ug/l), they were not detected during the August 2004 sampling event.

Aromatic organics have also generally not been detected in groundwater samples collected from Putnam Street wells OW2 and OW3, Washington Boulevard well OW4a, and upgradient well OW7. Low levels of benzene (ranging from 0.79 to 1.8 ug/l) were detected in well OW4b during the August 2002 and February 2003 semi-annual sampling events, respectively. Acetone was routinely detected in well OW4b during groundwater sampling events prior to February 2004, at concentrations ranging from 28 to 1,500 ug/l. In addition, 2-propanol was also detected in the well prior to August 2002 at concentrations ranging from 350 to 940 ug/l.

Benzene, toluene, and acetone have also been detected in groundwater samples collected from well OW8 during quarterly and semi-annual sampling events. Benzene was detected at a concentration of 5.3 ug/l during the August 2002 semi-annual sampling event. Toluene concentrations during semi-annual sampling events ranged from 1.9 ug/l (March 2002) to 340 ug/l (August 2004), and acetone concentrations ranged from 41 ug/l (March 2002) to 7,400 ug/l (August 2004). An estimated concentration (i.e., below the reporting limit) of acetone was detected at a concentration of 5.7 ug/l in deeper well OW8b during it's initial August 2004 sampling event.

Acetone concentrations in deeper well OW4b have declined from a high of 1,500 ug/l in November 2001 to below the reporting limit (8.4 ug/l in February 2004 and 5.2 ug/l in August 2004). The detection of acetone in well OW4b is believed to be a result of cross-contamination from coatings used in the manufacture of bentonite pellets at the time the well was installed. This problem was observed at many other sites where bentonite pellets have been used for well construction. Corrective action has since been taken by the manufacturer to resolve this issue. Acetone has been consistently detected at elevated concentrations only at location OW8. Uncoated bentonite pellets were used during the construction of well OW8, therefore, the acetone detections in shallow well OW8 are likely derived from the Site or other unknown sources.

3.3.3 Semi-VOCs, Pesticides, and Metals

Semi-VOCs and pesticides were analyzed for and not detected at locations OW1 and OW1b during all four quarterly sampling events (see Table 3-5). Total and dissolved metals were also analyzed at these two well locations and were generally found at background concentrations during all four quarterly sampling events (see Table 3-6). Based on these results, sampling and analysis for these parameters was discontinued at the start of semi-annual sampling.

3.3.4 Emerging Compounds

During the February 2003 semi-annual sampling event, additional analysis for three emerging compounds (hexavalent chromium, perchlorate, and 1,4-dioxane) at selected well locations was included in the analytical suite. Perchlorate was also analyzed in wells OW1 and OW1b during the four quarterly sampling events. Analysis for 1,4-dioxane has also been performed at all well locations since the November 2001 quarterly sampling event. Emerging compounds results are summarized in Table 3-7.

Perchlorate was detected in only one well, OW4b, at a concentration of 9.4 ug/l. Hexavalent chromium was detected in wells OW2, OW3, OW4a and OW8 at concentrations of 3.1, 5.4, 12 and 1.1 ug/l, respectively, during the February 2003 semi-annual sampling event.

The compound 1,4-dioxane was detected at high concentrations in groundwater samples collected from on-site well OW1, and ranged from 3,300 ug/l (estimated) during the November 2001 sampling event to 52,000 ug/l during the February 2003 semi-annual sampling event. The concentrations detected in deeper well OW1b were several orders of magnitude less, and ranged from 14 ug/l in August 2004 to 60 ug/l in August 2002.

1,4-dioxane was also detected in groundwater samples collected from well OW8 during the quarterly and semi-annual sampling events. Concentrations declined steadily from 1,000 ug/l in March 2002 to 180 ug/l in February 2003. Significantly increased concentrations were reported in samples collected from the well during test pumping at that location (2,600 ug/l during March 2003 and 2,700 ug/l during November 2003). The concentration declined to 210 ug/l in February 2004, and increased to a maximum of 5,300 ug/l during the August 2004 sampling event.

Relatively low concentrations of 1, 4-dioxane were detected in groundwater samples collected from wells OW2, OW3 and OW4a, with maximum detected concentrations of 12, 1.6, and 14 ug/l, respectively. 1,4-dioxane was not detected in deeper wells OW4b and OW8b. As was observed for chlorinated VOCs, 1,4-dioxane concentrations were observed to decline with increased depth and distance downgradient from the Site.

3.3.5 Biodegradation/Natural Attenuation Parameters

As discussed previously, various biodegradation/natural attenuation parameters were analyzed during the most recent semi-annual sampling event in February 2003. Analysis was performed in the field using field test kits and direct reading instruments, and also by an off-site laboratory. Laboratory results are summarized in Table 3-8, with field results summarized in Table 3-9.

Laboratory Results

Nitrate concentrations ranged from 11 to 8.8 milligrams per liter (mg/l) in samples collected from the water table wells (OW1, OW2, OW3, OW4a, and OW8) to 2.7 mg/l in deeper well OW1b. Nitrate was not detected in deeper well OW4b. Nitrite was detected at a concentration of 1 mg/l at one well location (OW1b).

In accordance with the criteria specified in Section 2.2, samples for methane, ethane, and ethene analyses were collected from water table wells OW1 and OW8, and deeper well OW1b. Concentrations in well OW1 were 4.8 ug/l; 3,200 nanograms per liter (ng/l); and 1,400 ng/l, respectively. Concentrations in deeper well OW1b were 2,400 ug/l; 480 ng/l; and 1,500 ng/l, respectively. Concentrations in well OW8 were 4.7 ug/l; 36 ng/l; and 1,000 ng/l, respectively.

Field Results

As shown in Table 3-9, electrical conductivity measurements ranged from 1,140 micromhos per centimeter (umhos/cm) at well location OW1b to 1,676 umhos/cm at well location OW8. pH measurements ranged from 6.73 at well location OW1 to 7.30 at well location OW4b. Dissolved oxygen measurements for samples collected from source area wells OW1 and OW1b were less than 1 parts per million (ppm). Redox potentials were negative at locations OW1, OW1b, OW4b, and OW8. Carbon dioxide was detected at all sampled locations except for well OW4b. Ferrous iron was detected at well locations OW1, OW1b, OW3, and OW8. Sulfate concentrations ranged from 162.5 mg/l (OW1) to 475 mg/l (OW1b). Chloride concentrations ranged from 26.25 mg/l (OW3) to 72.5 mg/l (OW8).

3.4 Soil Sampling Analytical Results

A total of 33 soil samples for laboratory analysis were collected from borings GP1 through GP8 during the drilling program described in Section 2.3 of this document. Analytical reports are provided in Appendix D, with a summary of all detected compounds provided in Table 3-10. The MIP screening results are also provided in Appendix D.

PCE was detected most frequently and at elevated concentrations at all of the sampled locations. At location GP3A, PCE concentrations decreased from 3,200 ug/kg at a depth of 10 feet bgs to 130 ug/mg at a depth of 32 feet bgs. PCE then increased to reach a maximum concentration of 12,000 ug/kg at a depth of 65 feet bgs. TCE concentrations at location GP3A ranged from 6.9 ug/mg at a depth of 30 feet bgs to 190 ug/kg at a depth of 65 feet bgs. Two other chlorinated VOCs were also detected at elevated levels in the boring, as follows: 1,1,1-TCA at a maximum concentration of 130 ug/kg at a depth of 65 feet bgs, and 1,2-dichloroethane (1,2-DCA) at a maximum concentration of 220 ug/kg at a depth of 45 feet bgs. Several other chlorinated VOCs (1,1,2-TCA; 1,1-DCA; and CFM) were also detected in the boring at concentrations less than 10 ug/kg.

1,4-dioxane concentrations at this location decreased in the interval from 10 to 32 feet bgs (from 10,000 to 300 ug/kg), and declined to non-detectable levels from 45 feet to the bottom of the boring at 85 feet bgs. It is likely that this former UST area was a source area for spills or leaks from the former UST. The increases in PCE, TCE, and 1,1,1-TCA noted above at 65 feet bgs are likely the result of contaminants migrating from contaminated groundwater to the capillary fringe during times of historical high water table conditions.

3.5 Aquifer Testing

From March 10 through March 14, 2003, CDM conducted four single borehole pumping tests at wells OW2, OW3, OW4a, and 8. Each test was approximately four-hours in duration. CDM used an In-Situ Mini-Troll™ datalogger/sensor to monitor water levels at logarithmic intervals in the pumping well during the test activities. CDM also collected manual water level measurements prior to, during, and after the testing period in the pumping well and closest observation wells. During November 2003, longer-term constant rate pumping was performed at well OW8. The newly-installed piezometers and nearby wells were utilized as observation wells.

CDM metered the discharge during each test and collected totalizer readings at the beginning and end of the pumping period. Due to some flow adjustments made during testing, a constant discharge rate was difficult to maintain at the locations of OW2, OW3, and OW4a. Totalizer readings were used to estimate the average pumping rate for the entire test period. Therefore, the average pumping rate calculated from the totalizer readings may not reflect the true rate at any specific period during the test. As discussed previously in Section 2.1.2, groundwater samples were collected for laboratory analysis immediately prior to the termination of pumping at each tested well location. The analytical results of samples collected during aquifer testing are discussed below.

3.5.1 Water Quality Sampling and Analysis

As previously discussed, water quality samples for laboratory analysis were collected just prior to the termination of pumping at all well locations which were test pumped during March 2003 (OW2, OW3, OW4a, and OW8) and November 2003 (OW8).

VOC concentrations in samples collected from wells OW2, OW3, and OW4a during March 2003 were generally comparable to concentrations detected during the February 2003 semi-annual sampling event. Concentrations of PCE, TCE, 1,1-DCE, 1,1-DCA, 1,2-DCA, and CFM detected in samples collected from well OW8 were generally two to three times higher during March 2003 compared to February 2003.

1,1,1-TCA concentrations in well OW8 increased approximately an order of magnitude from February 2003 to March 2003. Freon 113 and Freon 11 concentrations in well OW8 were comparable during the two sampling events. The concentration of toluene in well OW8 was approximately 20 times higher during March 2003.

The concentration of 1,4-dioxane in the sample collected during March 2003 from well OW8 was 2,600 ug/l, an approximate order-of-magnitude increase compared to the February 2003 result of 240 ug/l. A duplicate sample collected from well OW8 also reported a 1,4-dioxane concentration of 2,600 ug/l. The concentrations of 1,4-dioxane in the other three test pumped wells (OW2, OW3 and OW4a) during March 2003 remained relatively low or non-detected, and were not observed to increase compared to the February 2003 results.

Similar concentration increases were also noted during the November 2003 sampling event which followed approximately 20 hours of pumping at well OW8. There are several possible reasons for the observed increases in well OW8 during the March and November 2003 sampling events. The higher levels were observed after well OW8 had been pumping at an increased rate, likely drawing from areas of higher mass closer to the source area on the site. During March 2003 aquifer testing, for example, well OW8 was pumped at approximately 10.4 gallons per minute (gpm) for 4 hours, with approximately 2,500 gallons of groundwater pumped from the well. During routine groundwater sampling one month earlier in February 2003, the well was purged at approximately 3 gpm for 40 minutes, with a total purge volume of 117 gallons. It is also possible that variations in sampling equipment could have had some effect on the sample. The sample collected immediately prior to the termination of aquifer testing was collected directly from the discharge line. The sample collected during routine groundwater sampling was collected using a disposable bailer lowered to the middle of the perforated section after the portable pump had been removed from the well. This is the standard USEPA-approved procedure which is utilized during routine groundwater sampling of Omega wells. In addition, as discussed below, well OW8 appears to be located within a higher-permeability channel-like deposit which may be more hydraulically connected to higher mass, upgradient areas than wells OW2 and OW3. Another explanation for the increased concentration is that a cross-gradient portion of the plume may have been tapped via a preferential groundwater flow pathway, such as the sand channel, due to changes in the flow field during the test. In addition, there was a lack of similar increase observed for other chlorinated VOCs (e.g., PCE and TCE). This suggests a possible difference between the transport and release mechanisms for 1,4-dioxane vs. PCE and TCE. Fate and transport mechanisms for these compounds are discussed in detail in Section 4.1.4.

3.5.2 Evaluation of Aquifer Parameters

CDM evaluated aquifer properties from the results of the four single borehole pumping tests and one multiwell aquifer performance test by analyzing the pumping test drawdown and recovery curves in accordance to the methods described in the CDM Aquifer Hydraulic Tests Standard Operating Procedure (SOP-FL-010)

(CDM, July 15, 1993). Table 3-11 summarizes the test results and aquifer properties estimated from the various analyses that were performed. A description of each of the aquifer properties and methods used to estimate the aquifer parameters are provided below.

Drilling logs and well construction details are included in Appendix A and described in Section 3.1. For the purpose of analyzing the pumping test data, CDM reviewed the well logs and water level data to estimate the saturated thickness of the aquifer at each well location. Based on this review it appears that although the aquifer is overlain by about 50 feet of silty clay at the site, it is not completely saturated and, therefore, the shallow groundwater is considered to occur under water table (unconfined) conditions.

Transmissivity represents the capacity of the full aquifer thickness to allow passage of water. It is estimated using pumping test drawdown and recovery measurements. CDM estimated transmissivity from the pumping test data using manual straight-line curve matching based on the Cooper-Jacob solution as outlined in SOP-FL-010 for the single borehole tests. Figures E-1 through E-4 show the time-recovery plots for each of the single borehole pumping tests and the straight-line curve used to estimate transmissivity based on the Cooper-Jacob method. The Theis equation and all derivations used (Cooper-Jacob, t/t′) for analyzing the pumping tests are based on assumptions summarized in Driscoll (1986). The values estimated using the recovery data at the pumping well may be impacted by well losses and dewatering of the aquifer near the well.

Well OW2 was pumped at a rate of 2.3 gpm for a four hour period. The recovery curve shows the typical shape, with recovery to near the original level in a short period. The slope of the later portion of the recovery curve (small t/t′ values) was used to estimate the transmissivity, which was 170 ft^2 /day. Well OW3 was tested at a rate of 1.3 gpm for four hours. This test could not be analyzed due to the short recovery period that was monitored. The sustained production rate suggests that the transmissivity is lower than that observed at OW2. Well OW4a was pumped at 10.3 gpm for four hours. The recovery was rapid and returned to the pre-pumping level, with a recovery curve shape conforming to the expected response. The slope on the later portion of the curve resulted in a transmissivity estimate of 2691 ft^2 /day. Well OW8 was pumped at 10.4 gpm for four hours. The recovery curve does not return to pre-pumping levels, with about 7 feet of drawdown at the end of the recovery period. The shape of the recovery curve was as expected, and yielded a transmissivity estimate of 1616 ft^2 /day. This estimate is considered uncertain due to the high remaining drawdown at the end of the test and is superseded by results from the subsequent multiple well test in this area.

A multi-well test was conducted by pumping OW8 and monitoring the response at wells OW1b, OW2, OW3, OW4a, OW7, and OW8, and piezometers PZ-1 and PZ-2. The water level plots are provided in Appendix E. Well OW8 is screened across the entire saturated thickness of the upper aquifer, in the area where a lower permeability unit occurs within the aquifer. Groundwater occurs under water table conditions in this area, so an analytical method appropriate to unconfined conditions was chosen. The Neuman (1972) method of analysis for unconfined aquifers was selected as appropriate, since the wells are considered to fully penetrating the upper aquifer zone. Many of the monitored wells did not have significant drawdown and could not be analyzed in a quantitative manner. Wells OW4a and OW7 were not impacted by the test, since they are located far from the pumping well. Wells OW2 and OW3 showed a possible response to pumping, but the magnitude was too small for quantitative analysis. Well OW2 did not show any recovery after the pumping phase, suggesting that the water level decline observed during pumping may be coincidental. Well OW3 did show a small recovery after pumping, but the magnitude of the recovery was much lower than would be anticipated. Piezometers PZ-1 and PZ-2 showed good response to the test and were analyzed using the Neuman unconfined method cited above. Well OW1b was measured manually using a wireline probe. This well follows a trend similar to that observed at the pumping well, however, this appears to be coincidental and unrelated to the pumping test. Well OW1b is screened below the elevation of OW8 in a silt and clay zone and is 220 feet from well OW8. The magnitude of the apparent response is small (about 0.1 foot) and was determined from sparse manual measurements. Since this well is screened in very low hydraulic conductivity material that lies below the upper aquifer materials pumped at OW8, the response at this well, though uncertain, does not appear to be related to the testing at OW8. Water levels in wells OW1/OW1b will be monitored during future pumping in the Phase 1a area, in order to provide further information regarding a possible response at this location.

Well PZ-1 is located 48 feet from OW8, and exhibited a maximum drawdown of 0.49 feet. The drawdown curve is provided on Figure E-5, along with the fitted curve and aquifer parameters associated with the curve. Calculations for the Neuman curve fits were facilitated using the commercial software package AquiferWin32. The analysis at PZ-1 resulted in an estimate of 563 ft^2/day for transmissivity. Well PZ-2, located 53 feet from the pumping well, exhibited a maximum drawdown of 0.27 ft. Figure E-6 shows the drawdown and analysis for this well. The estimated transmissivity at PZ-2 was 810 ft^2/day. Based on the thickness of productive sand intervals at these wells, the hydraulic conductivity of these sands is estimated to range from 50 to 100 ft/day, for purposes of estimating velocities in the aquifer, based on a saturated thickness of less than 10 feet for the productive units within the screen zone. Estimates of the specific yield were also determined during the test, and ranged from 0.09 to 0.2. The test was likely not long enough to obtain a reliable estimate of the specific yield. Wells PZ-1 andPZ-2 are located at similar distances from the pumping well, yet show significant differences in hydraulic properties, suggesting that local variation is significant on scales of less than 100 feet. This local scale variability introduces some uncertainty on estimates of hydraulic characteristics, since one of the assumptions in the Neuman method is uniform characteristics within the tested domain. As previously discussed, all pumped water was contained in a portable storage tank for disposal at an off-site facility. It was, therefore, not practical to conduct a longer-term pumping test.

Background water levels were monitored at wells OW1, OW1b, OW4a, OW4b, OW7 and OW8 in March and April, 2004. Hydrographs of relative water level fluctuation for each of these wells are provided in Appendix E. Wells in the upper aquifer (OW1, OW4a, OW8 and OW8) indicated falling water levels, while the deep zone wells showed rising water level trends. The magnitude of the daily fluctuations was very small.

3.6 Quality Assurance/Quality Control and Data Validation

A variety of Quality Assurance/Quality Control (QA/QC) samples (e.g., duplicates and equipment blanks) were collected during groundwater sampling. In addition, double or triple volume for laboratory QC samples (Matrix Spike/Matrix Spike Duplicate [MS/MSD]) were also collected and submitted to the laboratory. QA/QC sample results are included in the analytical summary tables.

The laboratory provided both hard copy and electronic results. Electronic results were imported directly into the project's Access database. All laboratory analytical data generated during the groundwater monitoring events were reviewed and evaluated to ensure that they were usable and met the project objectives prior to incorporating the data into the database. To this extent, USEPA's Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review (USEPA, 1999 and 2002, respectively) were used in conjunction with the project work plan to assess overall analytical data quality.

Level IV data packets (CLP-Like) were requested for one sample group per groundwater monitoring event, which was subjected to formal data validation. A sample group consists of all samples collected on a single day and submitted to the analytical laboratory on an individual COC. Although a target validation frequency of 10 percent was proposed in the project work plan, the actual percentage was much greater and ranged from approximately 30 percent to nearly 70 percent depending on the analysis validated. The sample group selected for validation was based on the number and type of samples collected and the type of analyses requested. In other words, the sample group selected for validation contained the largest number of samples collected in one day and submitted for analysis of the greatest variety of parameters in order to provide the most comprehensive level of validation. A sample matrix is provided as Table H-1 (included with Appendix H), which summarizes the number and types of samples collected each day and identifies the samples that were formally validated. Data validation reports are included in Appendix H.

All other laboratory data that were not subject to formal validation were reviewed for data usability and for inclusion and frequency of the necessary QC supporting information. Supporting QC documentation that were evaluated for each analytical report included the following major items:

- sample holding times

- method blanks
- matrix spike/matrix spike duplicate (MS/MSD) recoveries
- relative percent difference (RPD) between MS and MSD
- laboratory control sample (LCS) recoveries
- surrogate recoveries (organic analyses)
- field quality control sample results

Prior to incorporating the Omega analytical data into the database, the electronic data were checked for accuracy against the hard copy analytical reports. Standard procedure includes contacting the laboratory in the event that discrepancies are discovered, resolving and correcting discrepancies, and reissuing the analytical reports, as necessary. Data validation reports for seven Level IV data packets (November 2001, February 2002, August 2002, February 2003, August 2003, February 2004, and August 2004) are presented in Appendix H. No significant QC issues were noted during the review process; therefore, with two minor exceptions, all data can be used for project purposes without qualification. The exceptions are the 1,4-dioxane result (1.6 ug/l) for well OW3 during August 2003, and the MC result (1.2 ug/l) for well OW1b during August 2004. Both results have been qualified in the database (and shown on the analytical summary tables) as "UB", indicating that the result was not detected due to the detection of the analyte in the laboratory method blank.

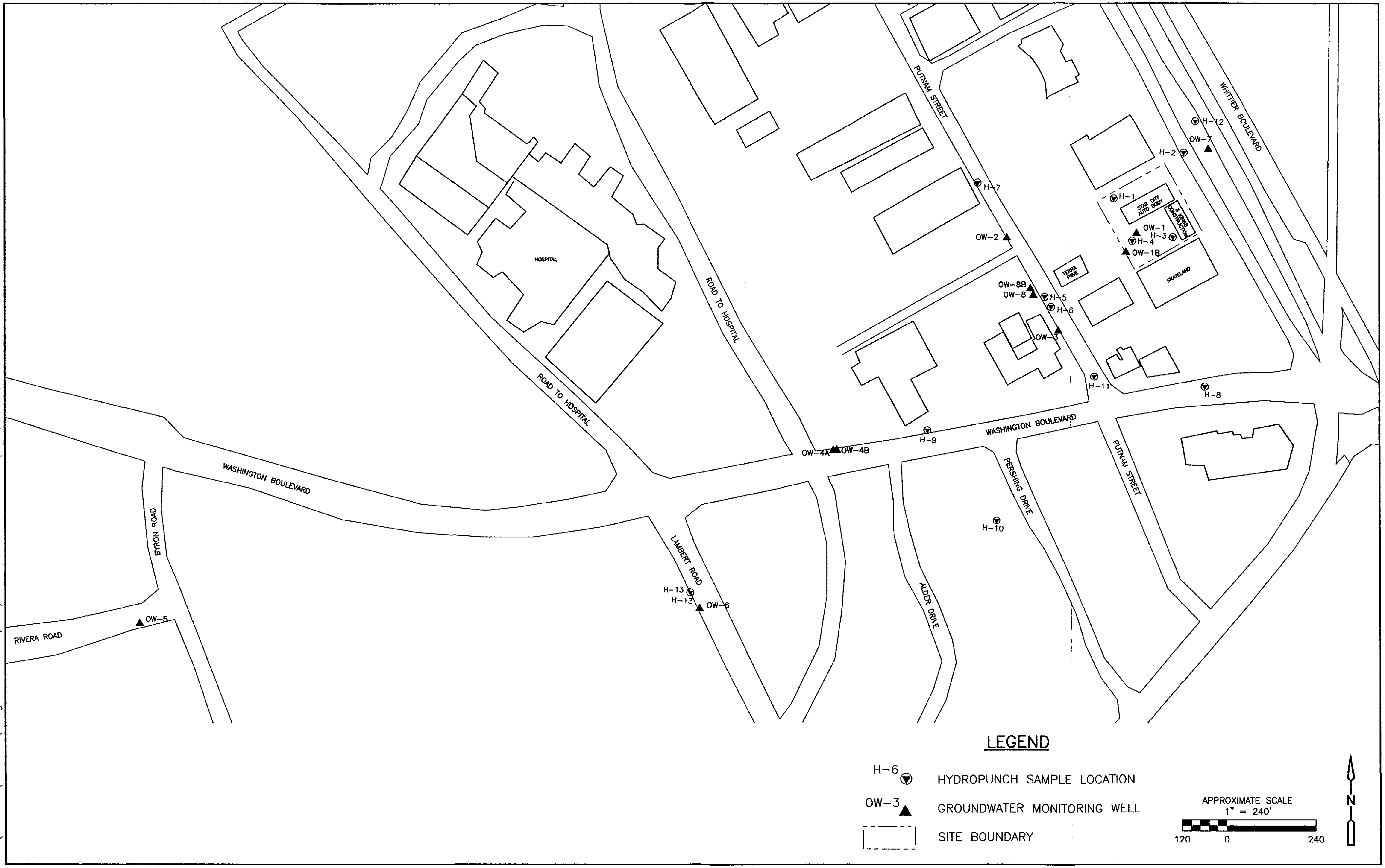

Figure 3-1
Monitoring Well Locations

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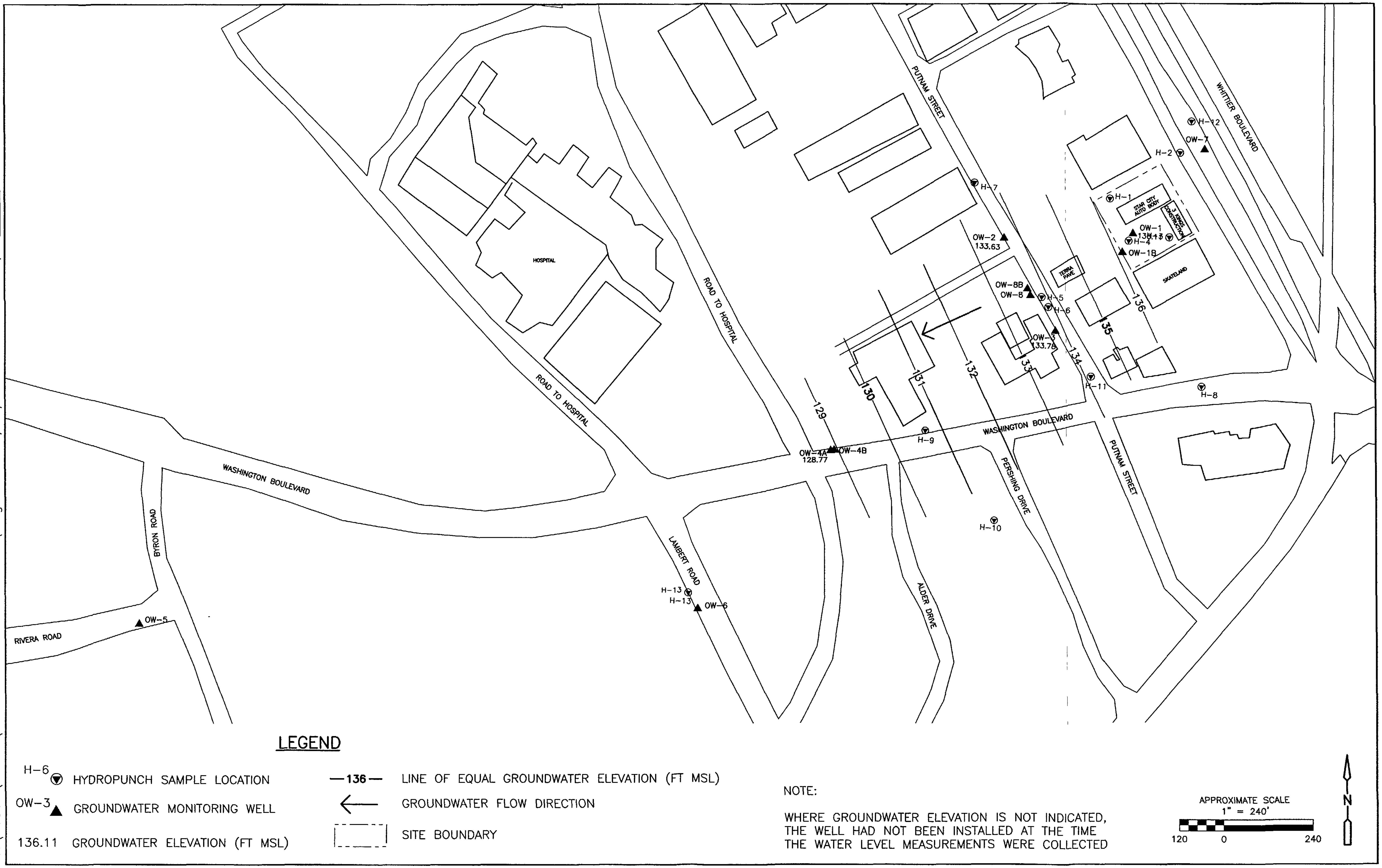

CDM

Figure 3-2
Groundwater Elevation Contour Map
May 2001

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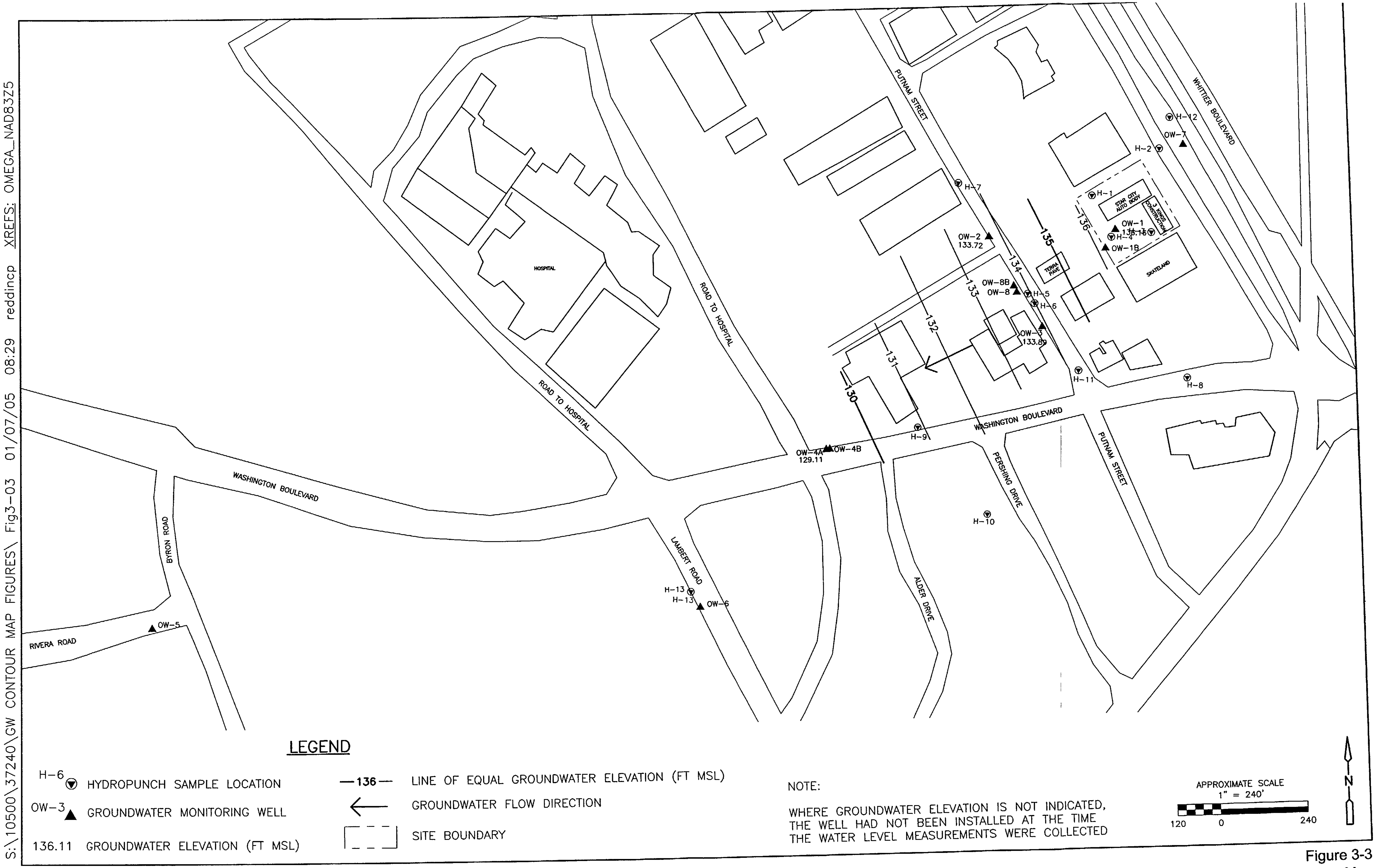
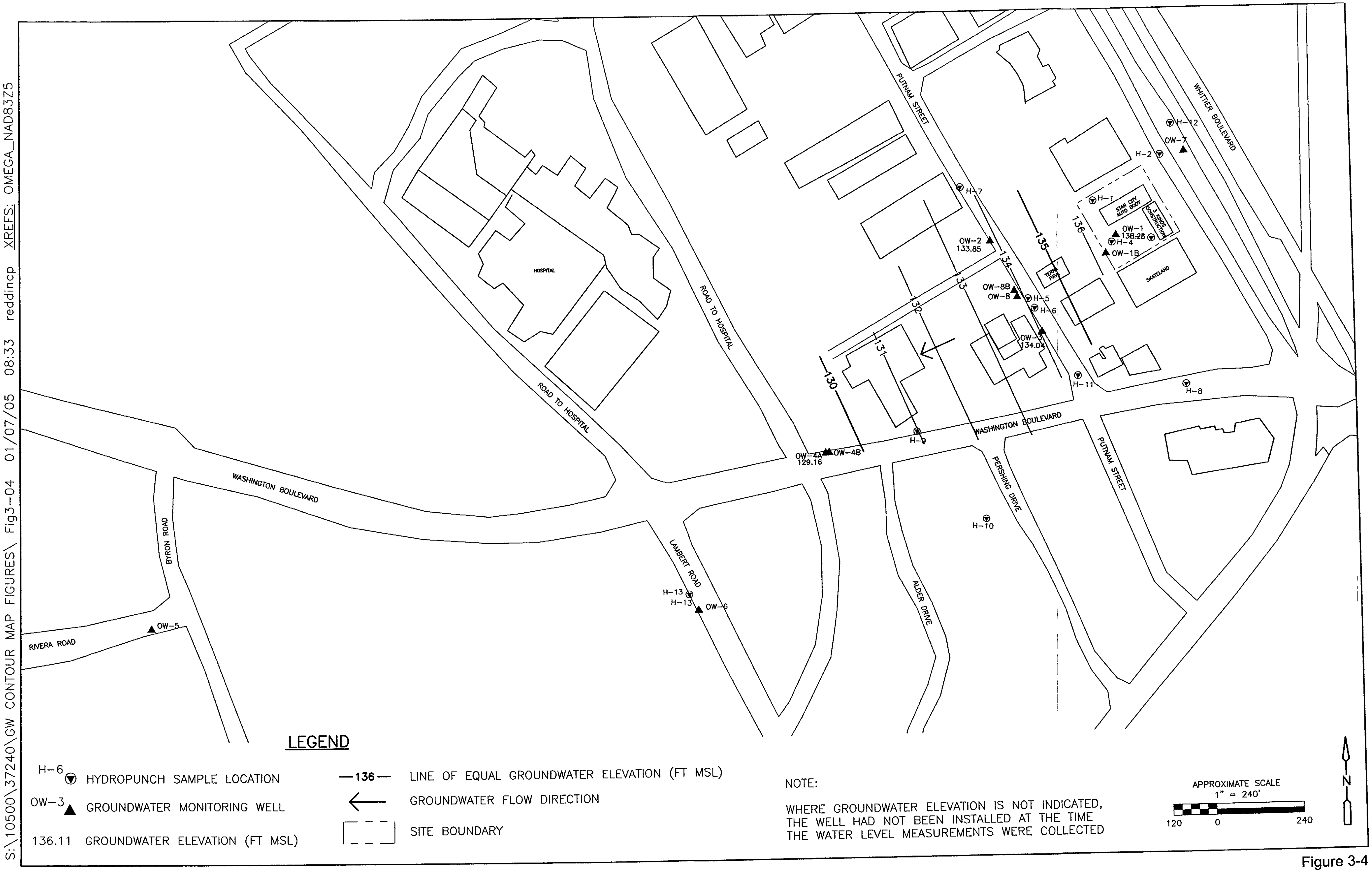


Figure 3-3
Groundwater Elevation Contour Map
June 2001

CDM



LEGEND

H-6 HYDROPUNCH SAMPLE LOCATION

OW-3 GROUNDWATER MONITORING WELL

136.11 GROUNDWATER ELEVATION (FT MSL)

—136— LINE OF EQUAL GROUNDWATER ELEVATION (FT MSL)

← GROUNDWATER FLOW DIRECTION

SITE BOUNDARY

NOTE:

WHERE GROUNDWATER ELEVATION IS NOT INDICATED, THE WELL HAD NOT BEEN INSTALLED AT THE TIME THE WATER LEVEL MEASUREMENTS WERE COLLECTED

APPROXIMATE SCALE
1" = 240'
120 0 240

N

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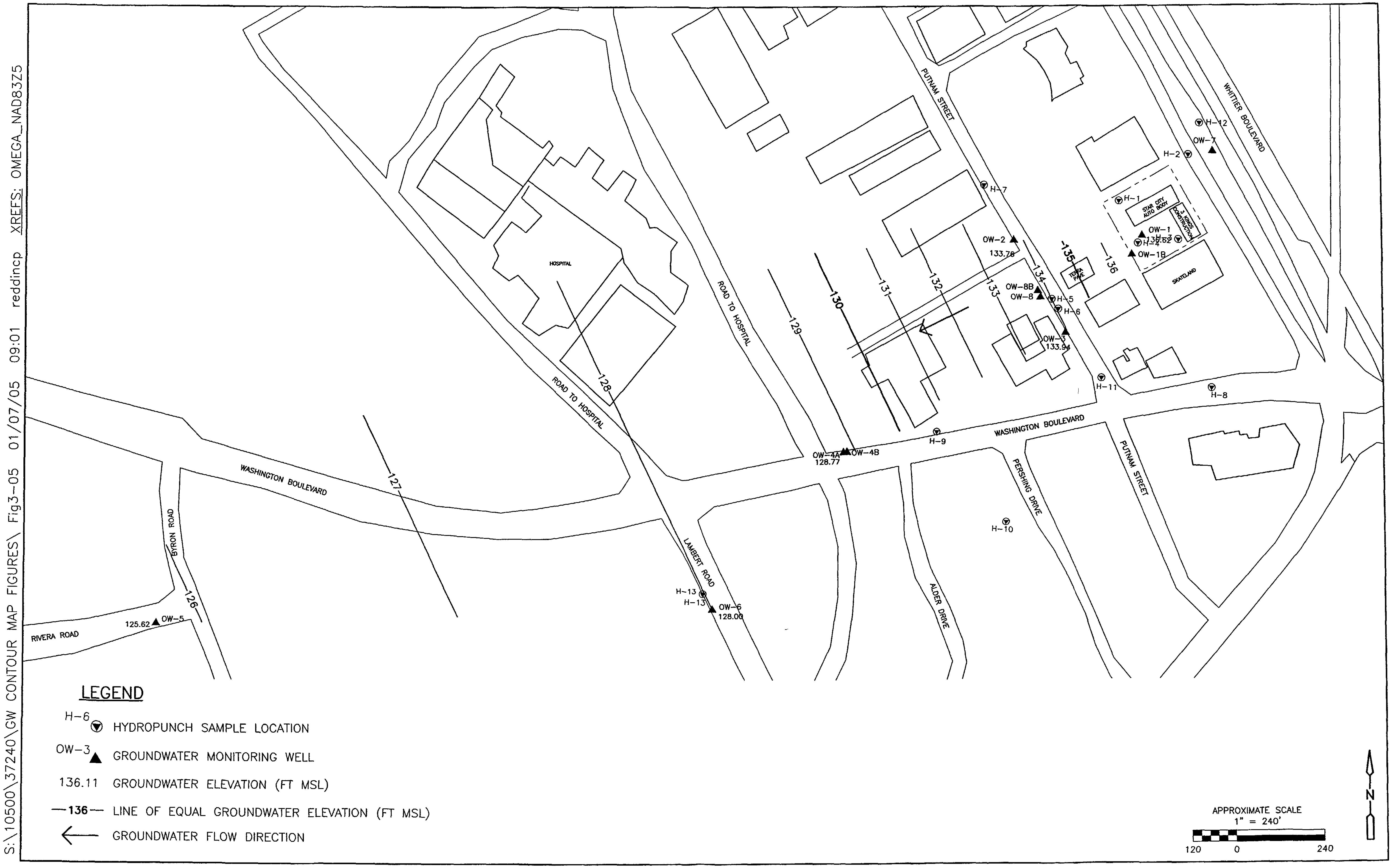
Figure 3-4
Groundwater Elevation Contour Map
July 2001

CDM



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CDM

Figure 3-5
Groundwater Elevation Contour Map
August 2001

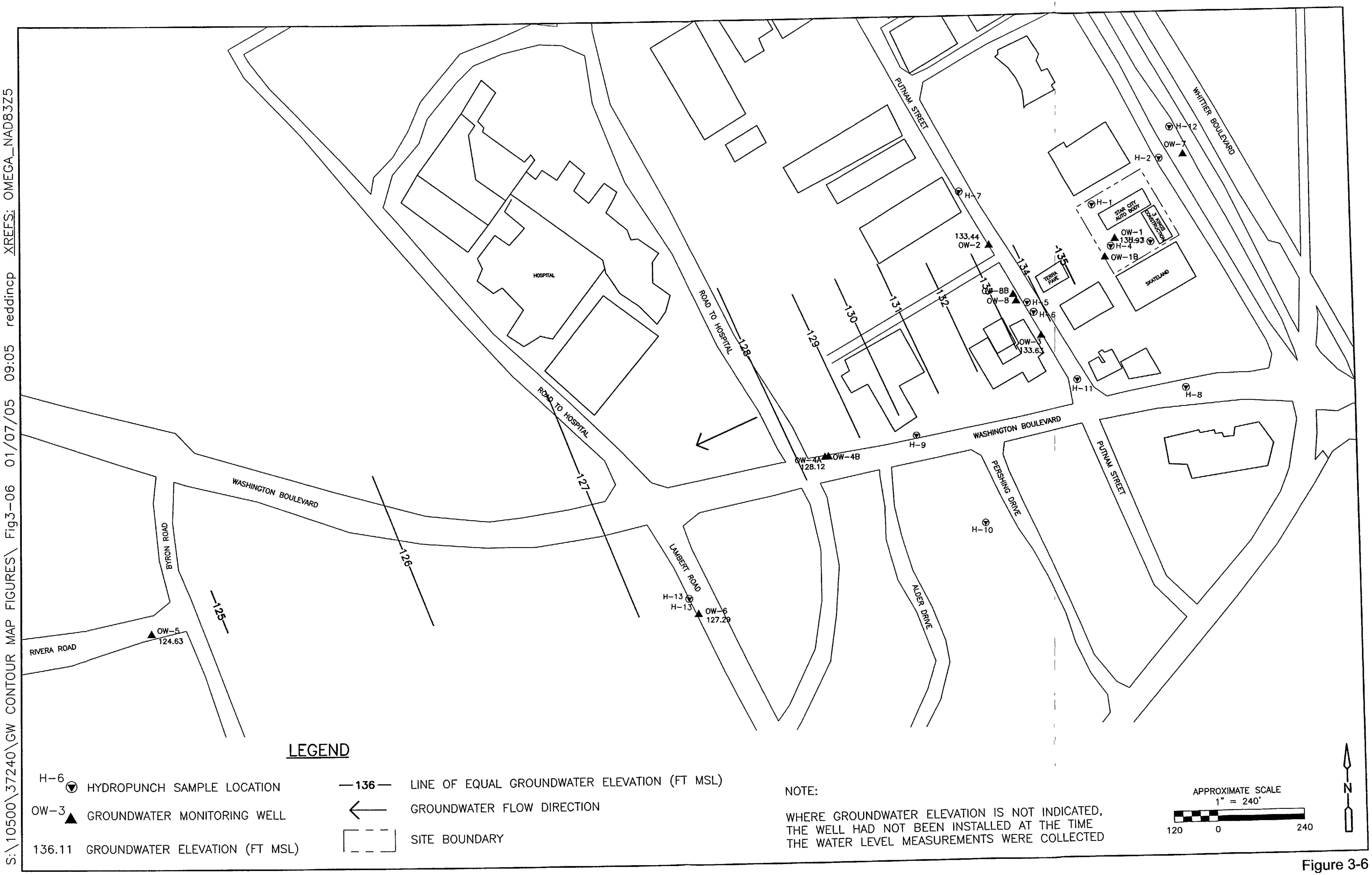

Figure 3-6
Groundwater Elevation Contour Map
September 2001

CDM

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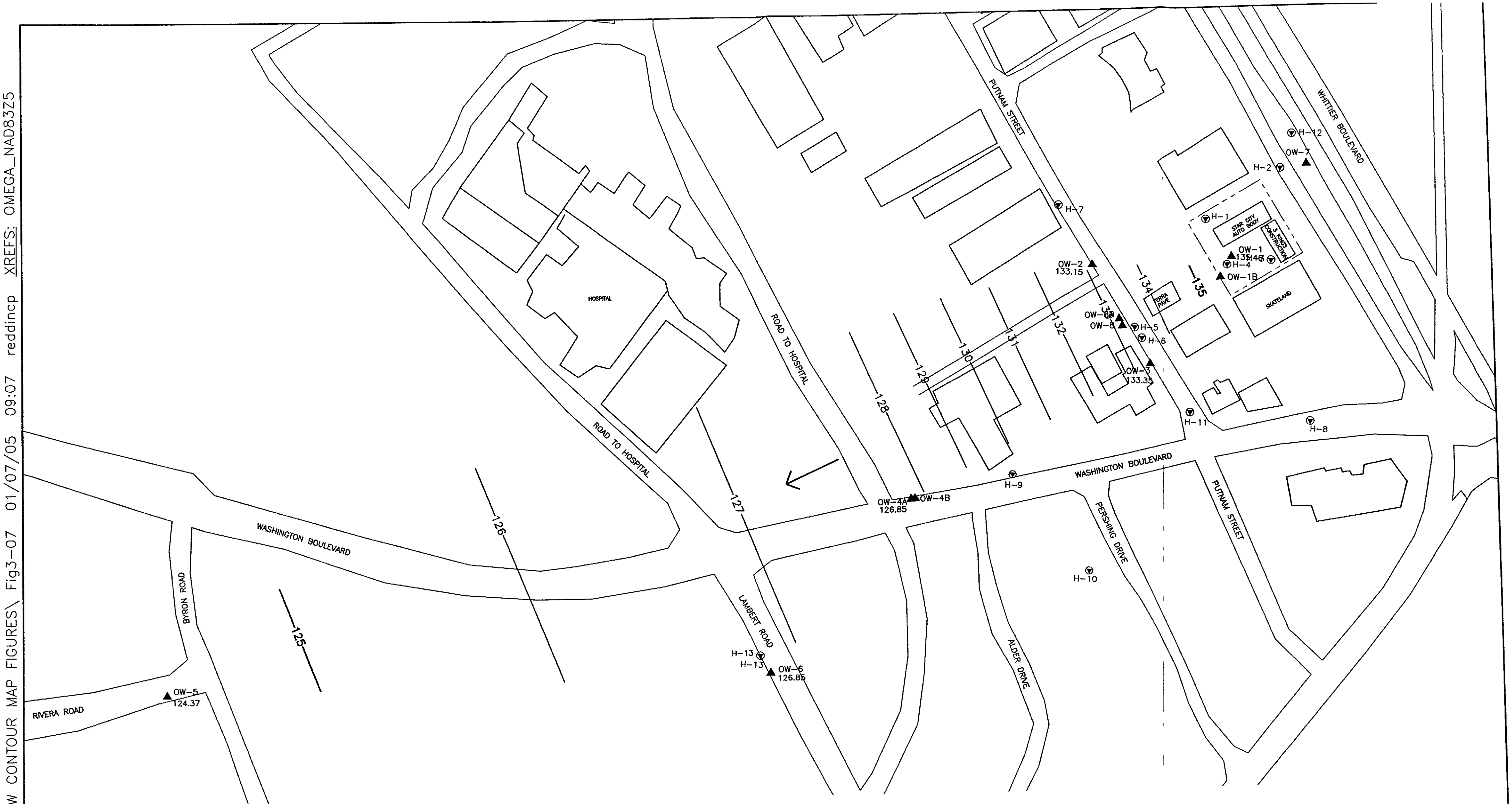

LEGEND

H-6 HYDROPUNCH SAMPLE LOCATION

OW-3 GROUNDWATER MONITORING WELL

136.11 GROUNDWATER ELEVATION (FT MSL)

—136— LINE OF EQUAL GROUNDWATER ELEVATION (FT MSL)

← GROUNDWATER FLOW DIRECTION

SITE BOUNDARY

NOTE:

WHERE GROUNDWATER ELEVATION IS NOT INDICATED, THE WELL HAD NOT BEEN INSTALLED AT THE TIME THE WATER LEVEL MEASUREMENTS WERE COLLECTED

APPROXIMATE SCALE
1" = 240'
120 0 240

N

Figure 3-7
Groundwater Elevation Contour Map
October 2001

CDM

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LEGEND

H-6 HYDROPUNCH SAMPLE LOCATION

OW-3 GROUNDWATER MONITORING WELL

136.11 GROUNDWATER ELEVATION (FT MSL)

—136— LINE OF EQUAL GROUNDWATER ELEVATION (FT MSL)

GROUNDWATER FLOW DIRECTION

SITE BOUNDARY

NOTE:

WHERE GROUNDWATER ELEVATION IS NOT INDICATED, THE WELL HAD NOT BEEN INSTALLED AT THE TIME THE WATER LEVEL MEASUREMENTS WERE COLLECTED

APPROXIMATE SCALE
1" = 240'
120 0 240

N

Figure 3-8
Groundwater Elevation Contour Map
November 2001

CDM

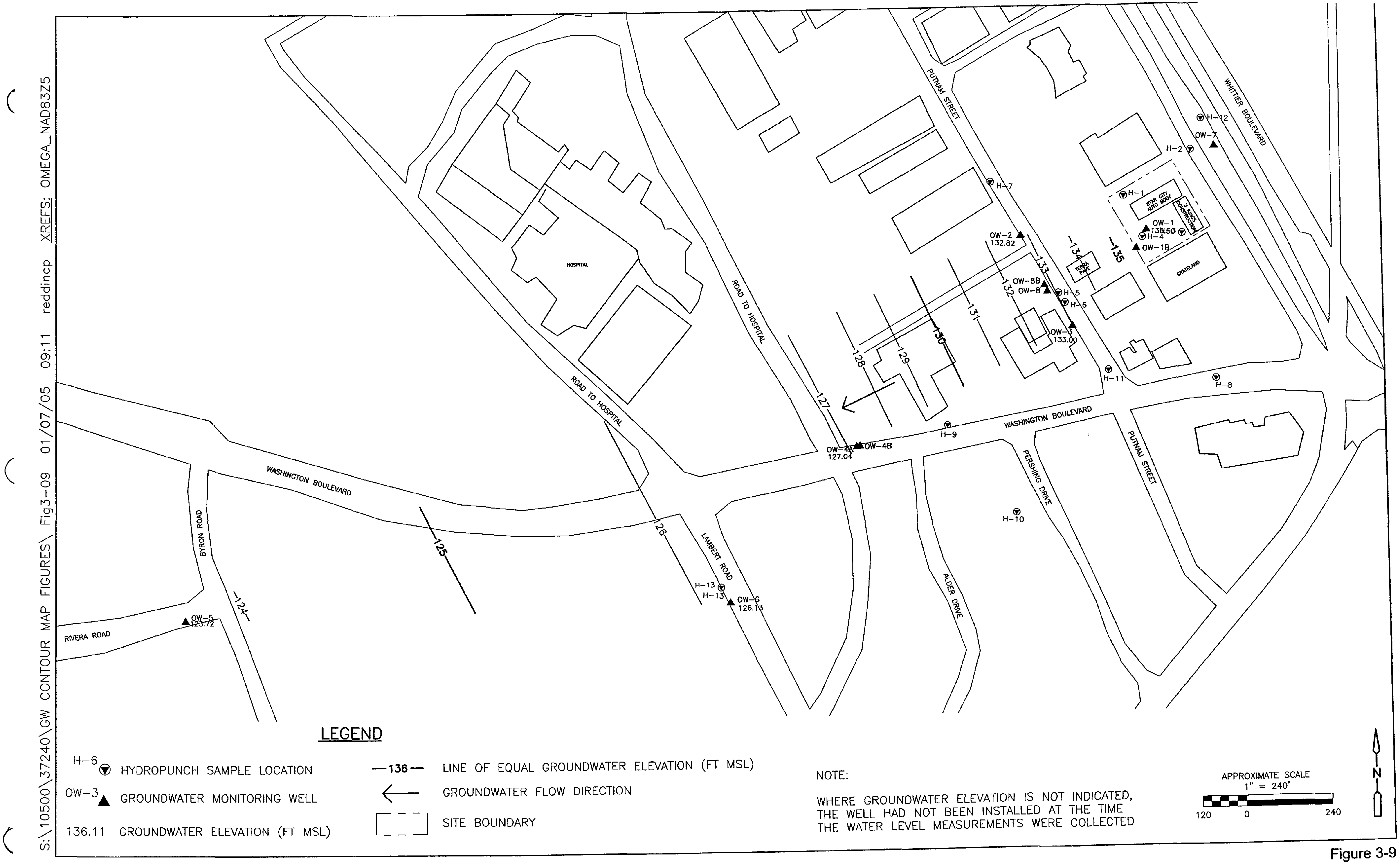

Figure 3-9
Groundwater Elevation Contour Map
December 2001

CDM

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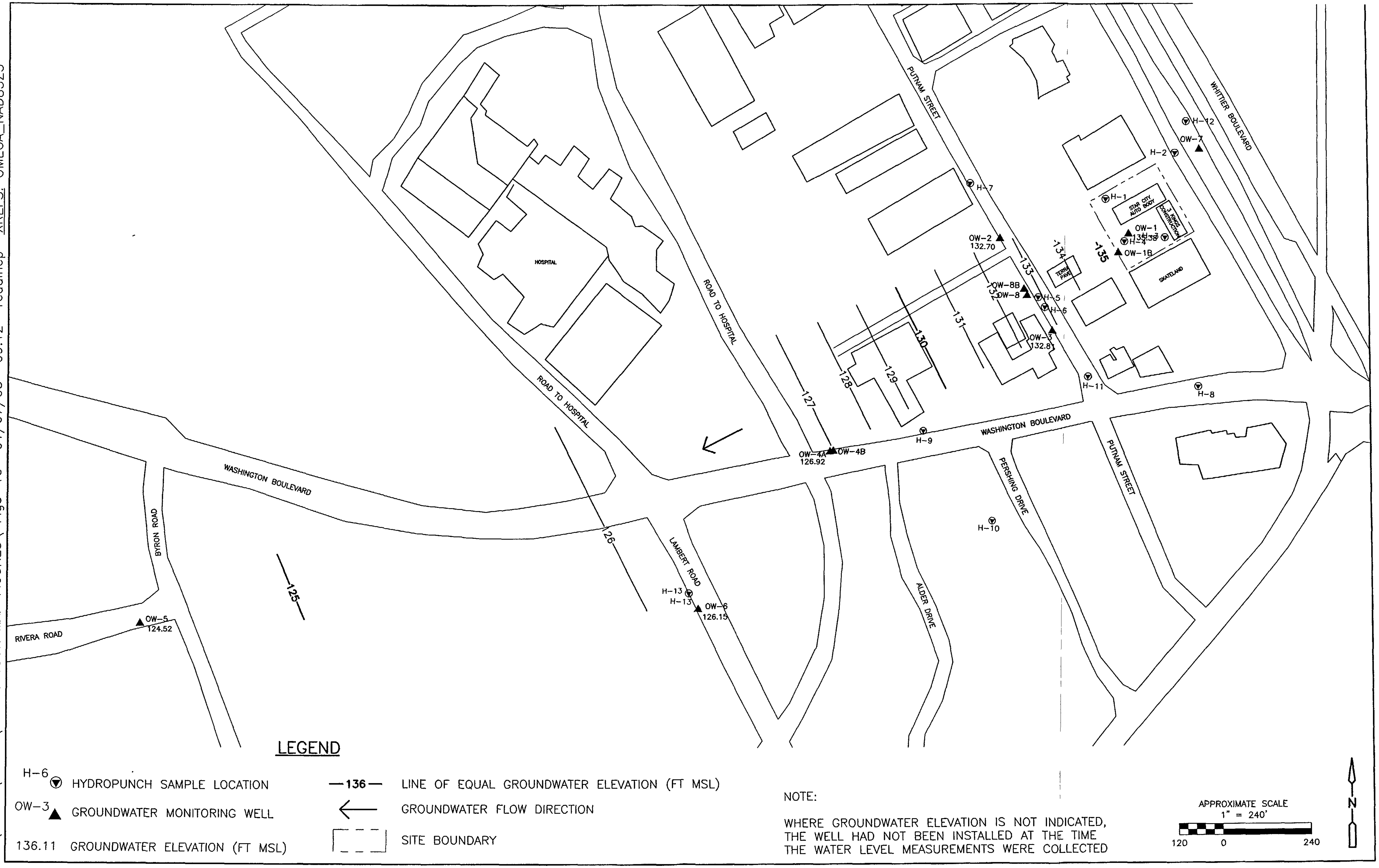

CDM

Figure 3-10
Groundwater Elevation Contour Map
January 2002

LEGEND

H-6 HYDROPUNCH SAMPLE LOCATION

OW-3 GROUNDWATER MONITORING WELL

136.11 GROUNDWATER ELEVATION (FT MSL)

—136— LINE OF EQUAL GROUNDWATER ELEVATION (FT MSL)

← GROUNDWATER FLOW DIRECTION

SITE BOUNDARY

NOTE:

WHERE GROUNDWATER ELEVATION IS NOT INDICATED, THE WELL HAD NOT BEEN INSTALLED AT THE TIME THE WATER LEVEL MEASUREMENTS WERE COLLECTED

APPROXIMATE SCALE
1" = 240'
120 0 240

N

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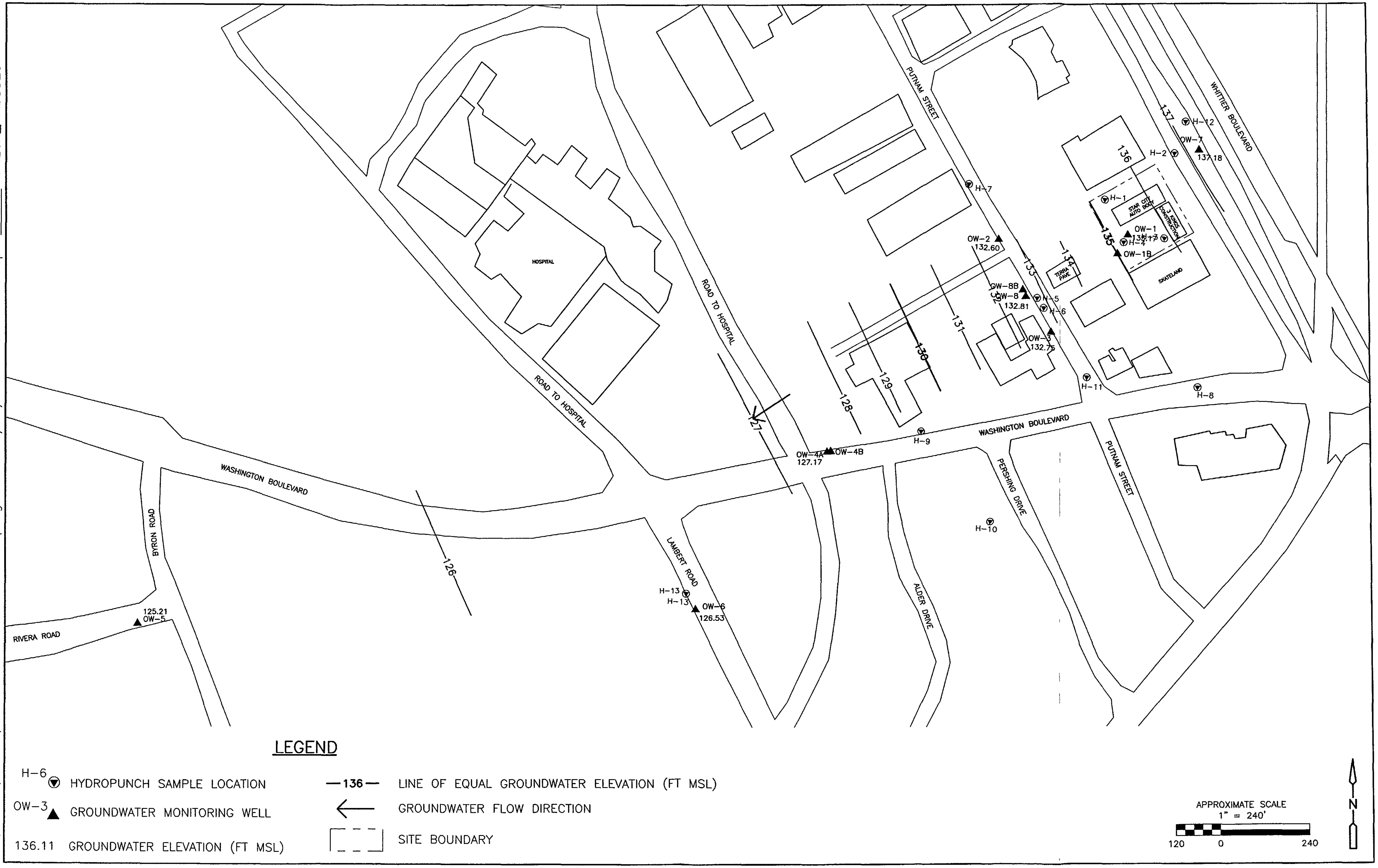
Figure 3-11
Groundwater Elevation Contour Map
Febuary 2002

CDM



CDM

Figure 3-12
Groundwater Elevation Contour Map
March 2002

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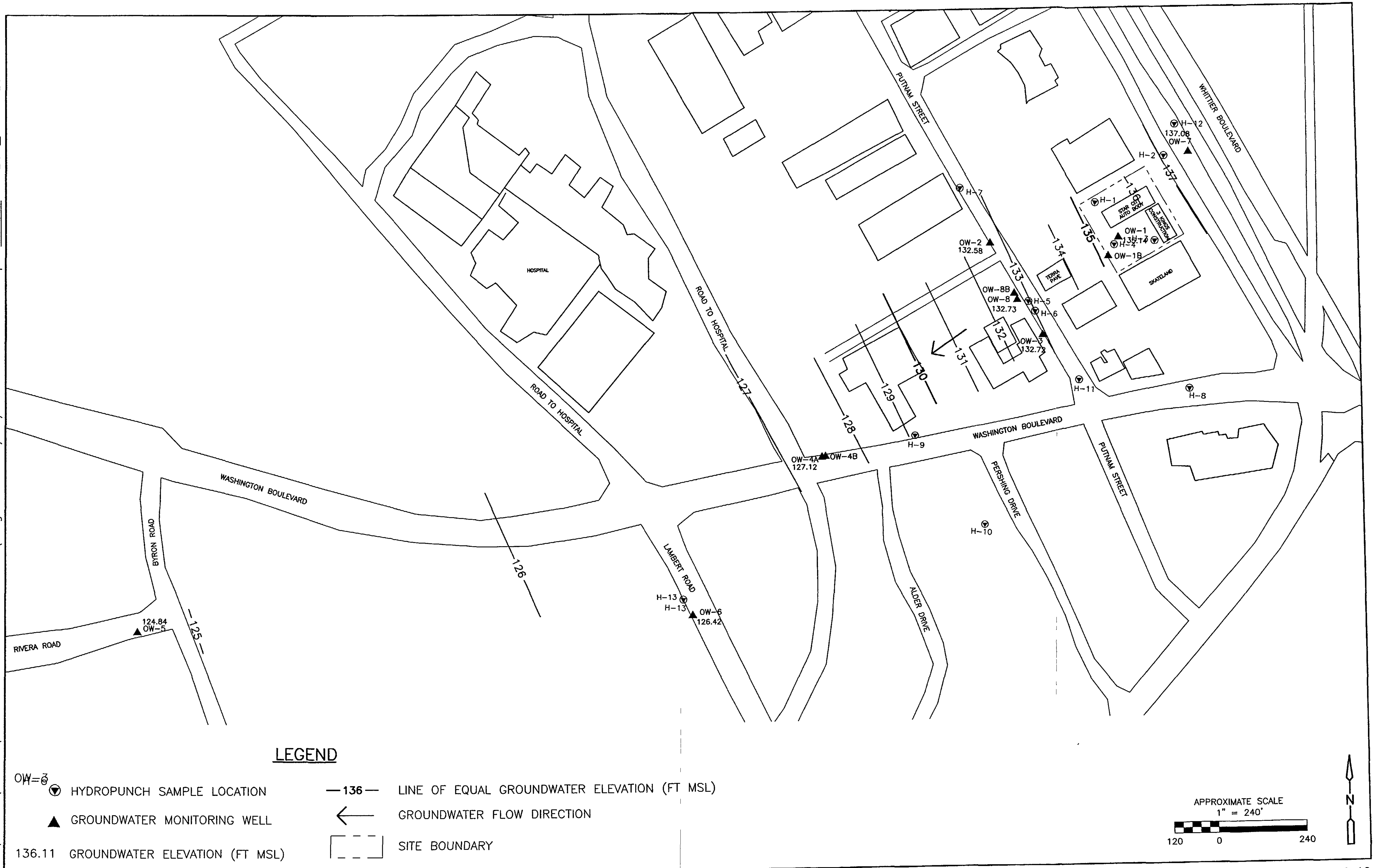

Figure 3-13
Groundwater Elevation Contour Map
April 2002

CDM

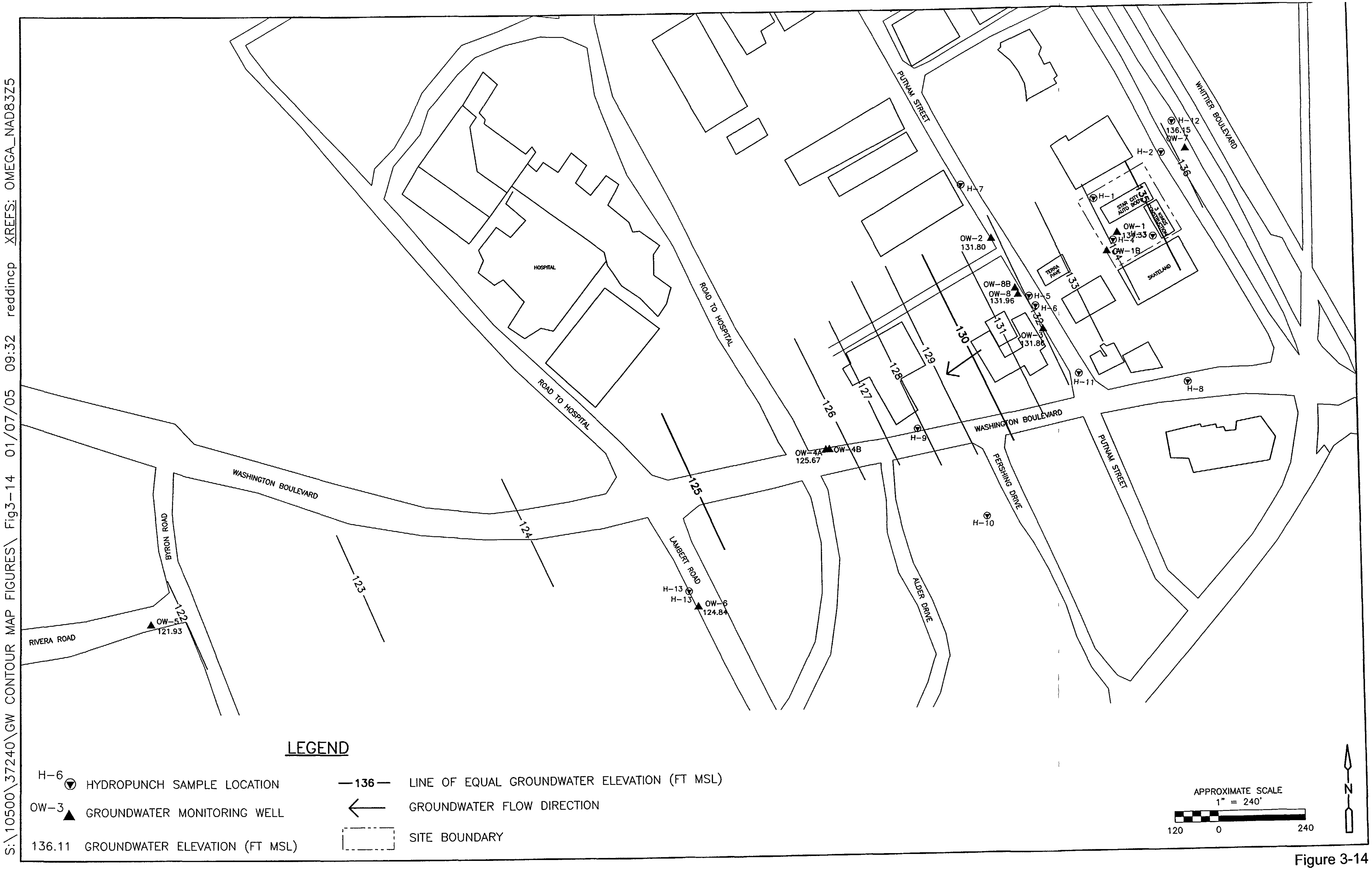

Figure 3-14
Groundwater Elevation Contour Map
August 2002

CDM

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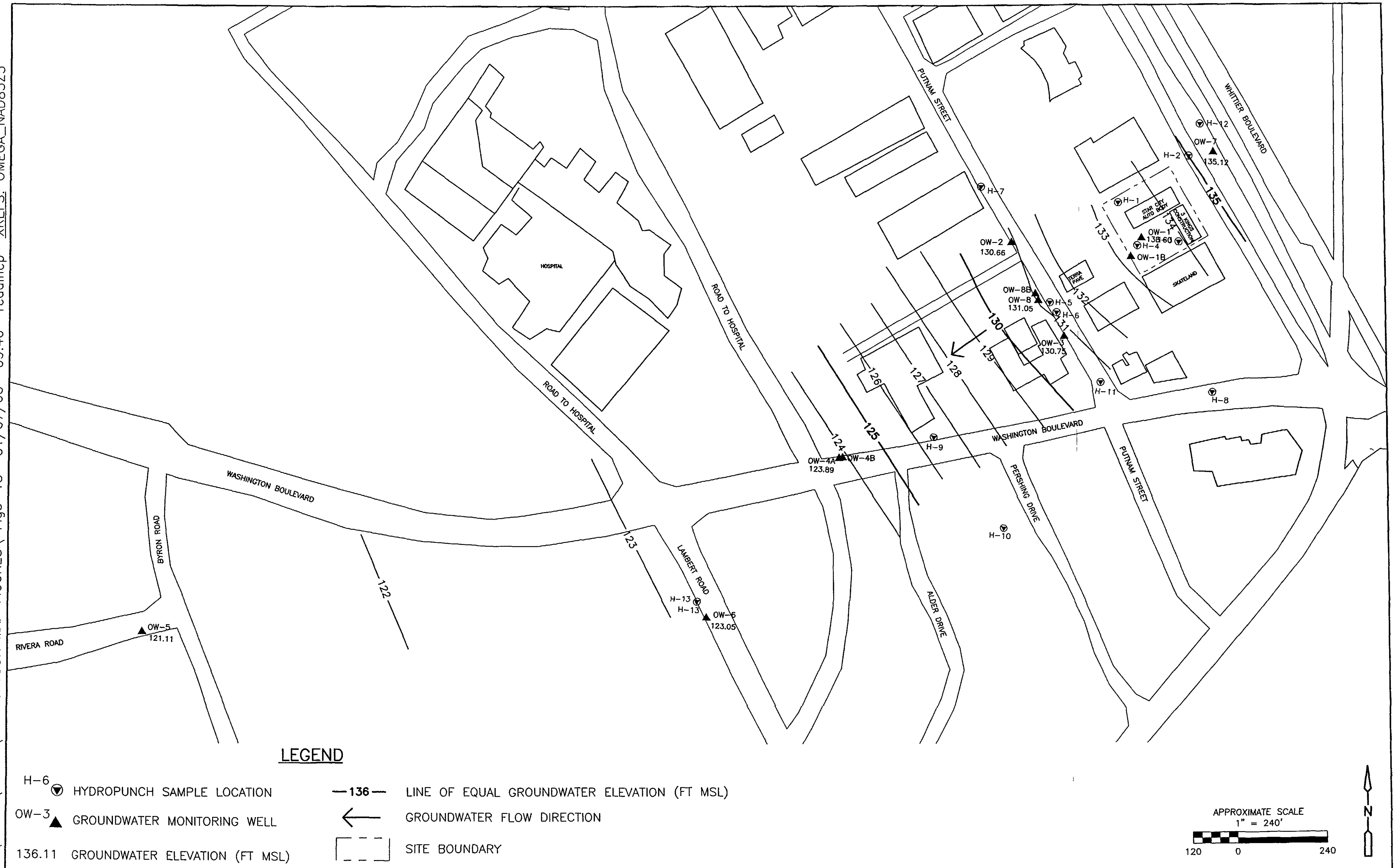

Figure 3-15
Groundwater Elevation Contour Map
Febuary 2003

CDM

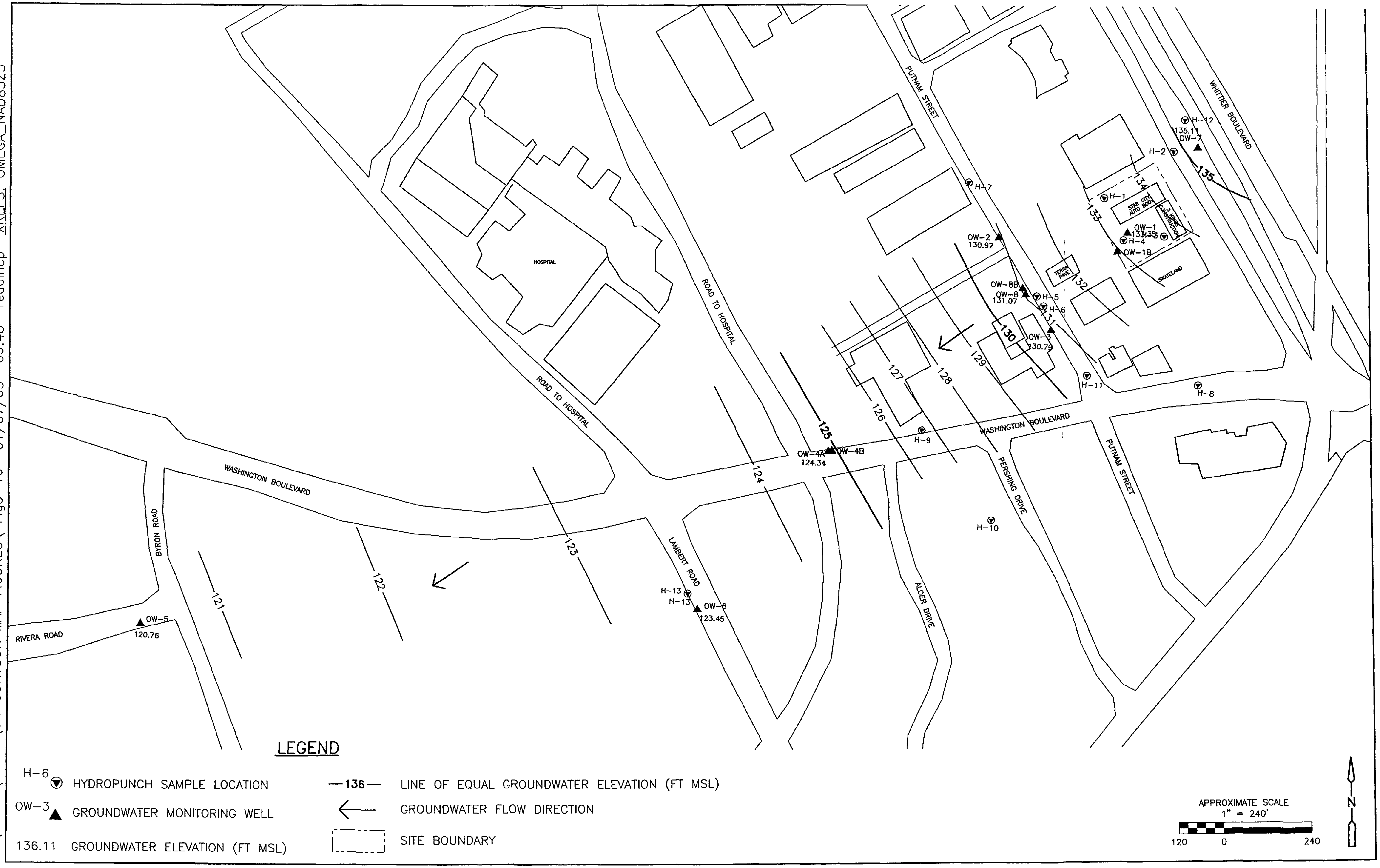

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Figure 3-16
Groundwater Elevation Contour Map
August 2003

CDM

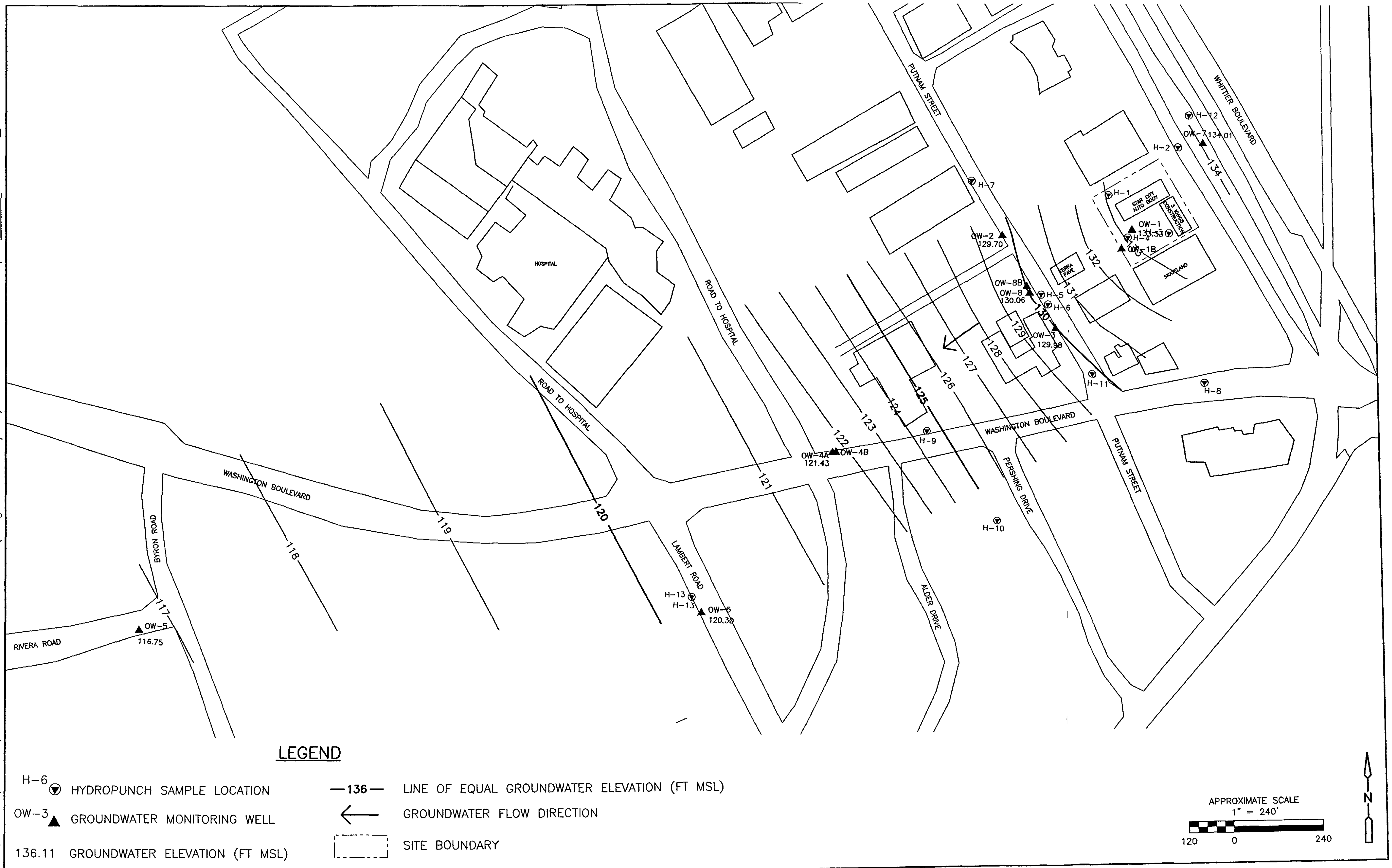

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Figure 3-17
Groundwater Elevation Contour Map
Febuary 2004

CDM

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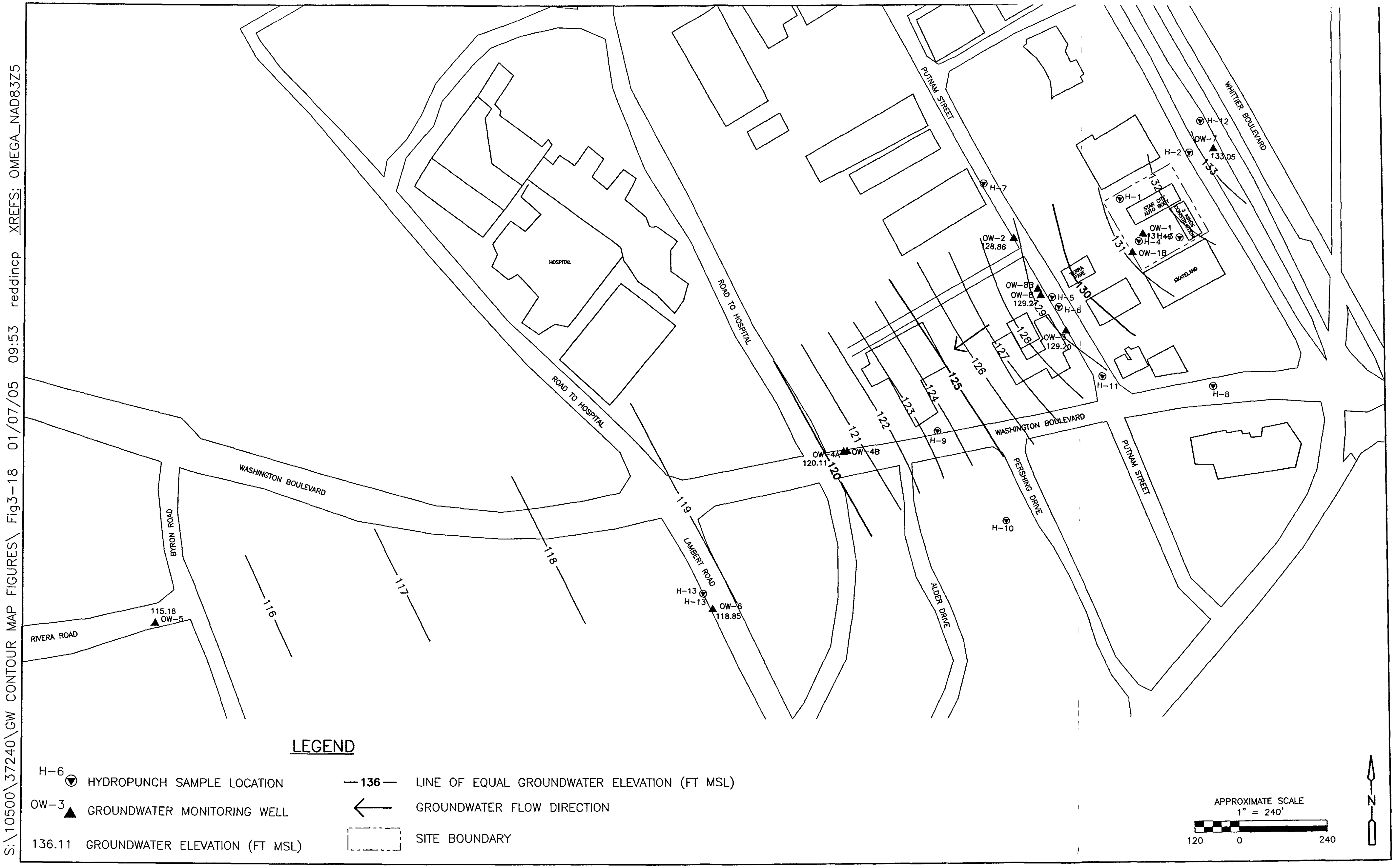

Figure 3-18
Groundwater Elevation Contour Map
August 2004

CDM

DATE: Jan 10, 2005 XREFS: OMEGA_MAP8325
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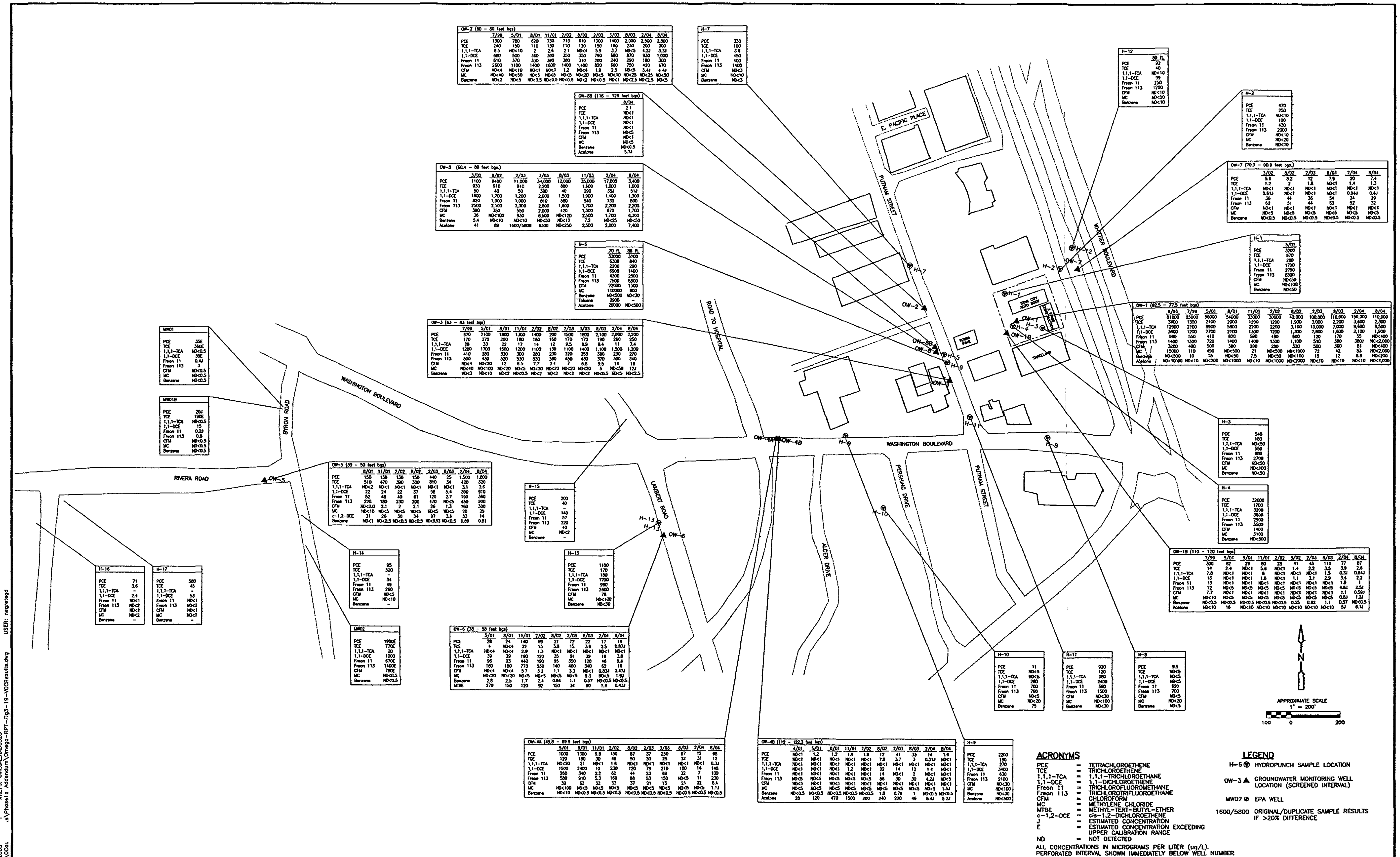

OW-2 (60 - 80 feet bgs)	7/99	5/01	8/01	11/01	2/02	8/02	2/03	3/03	8/03	2/04	8/04
PCE	1300	780	620	730	710	610	1300	1400	2,000	2,500	2,800
TCE	240	150	110	130	110	120	150	160	230	200	300
1,1,1-TCA	8.5	ND<10	2	2.6	2.1	ND<4	5.9	3.7	ND<5	4.2J	3.3J
1,1-DCE	680	500	360	390	350	350	790	680	870	930	1,000
Freon 11	610	370	330	390	380	310	280	240	290	180	300
Freon 113	2600	1100	1400	1600	1400	1,400	820	660	750	420	670
CFM	ND<4	ND<10	ND<1	ND<1	1.2	ND<4	1.9	2.5	ND<5	3.4J	4.4J
MC	ND<40	ND<50	ND<5	ND<5	ND<5	ND<20	ND<5	ND<10	ND<25	ND<25	ND<50
Benzene	ND<2	ND<5	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<0.5	ND<1	ND<2.5	ND<2.5	ND<5

H-7	
PCE	330
TCE	100
1,1,1-TCA	3.6
1,1-DCE	450
Freon 11	400
Freon 113	1400
CFM	ND<3
MC	ND<10
Benzene	ND<3

OW-8B (116 - 126 feet bgs)	8/04
PCE	2.1
TCE	ND<1
1,1,1-TCA	ND<1
1,1-DCE	ND<1
Freon 11	ND<1
Freon 113	ND<5
CFM	ND<1
MC	ND<5
Benzene	ND<0.5
Acetone	5.7J

OW-8 (60.4 - 80 feet bgs.)	3/02	8/02	2/03	3/03	8/03	11/03	2/04	8/04
PCE	1100	9400	11,000	34,000	12,000	35,000	17,000	3,400
TCE	930	910	910	2,200	880	1,600	1,000	1,600
1,1,1-TCA	50	49	50	390	40	290	35J	51J
1,1-DCE	1600	1,700	1,200	2,600	1,500	1,900	1,400	1,300
Freon 11	820	1,000	1,000	810	580	540	730	800
Freon 113	2500	2,100	2,300	2,800	1,600	1,700	2,200	2,200
CFM	390	350	550	2,000	420	1,300	670	1,700
MC	36	ND<100	930	6,500	ND<120	2,500	1,700	6,300
Benzene	5.4	ND<10	ND<10	ND<50	ND<12	7.2	ND<25	ND<50
Acetone	41	89	1600/5800	6300	ND<250	2,500	2,000	7,400

H-5	70 ft.	86 ft.
PCE	33000	3100
TCE	6300	840
1,1,1-TCA	2200	290
1,1-DCE	6900	1400
Freon 11	4300	2500
Freon 113	7500	5800
CFM	22000	1300
MC	110000	800
Benzene	ND<500	ND<30
Toluene	2900	-
Acetone	26000	ND<500

OW-3 (63 - 83 feet bgs)	7/99	5/01	8/01	11/01	2/02	8/02	2/03	3/03	8/03	2/04	8/04
PCE	670	2100	1800	1300	1400	200	1500	1800	2,100	2,800	2,200
TCE	170	270	200	180	180	160	170	170	190	260	250
1,1,1-TCA	28	33	22	17	14	12	9.5	8.9	9.4	11	7.4
1,1-DCE	1200	1700	1500	1200	1100	130	1100	1400	1,100	1,500	1,200
Freon 11	410	380	330	300	280	230	320	250	300	230	270
Freon 113	800	430	520	530	530	360	450	430	370	390	340
CFM	ND<4	ND<20	12	6.5	7.7	7.4	7	6.8	9.5	14	16
MC	ND<40	ND<100	ND<20	ND<5	ND<20	ND<20	ND<20	ND<20	5	ND<50	12J
Benzene	ND<2	ND<10	ND<2	ND<0.5	ND<2	ND<2	ND<2	ND<2	ND<0.5	ND<5	ND<2.5

H-12	80 ft.
PCE	92
TCE	40
1,1,1-TCA	ND<10
1,1-DCE	99
Freon 11	250
Freon 113	1200
CFM	ND<10
MC	ND<20
Benzene	ND<10

H-2	
PCE	470
TCE	250
1,1,1-TCA	ND<10
1,1-DCE	100
Freon 11	430
Freon 113	2000
CFM	ND<10
MC	ND<20
Benzene	ND<10

OW-7 (70.9 - 90.9 feet bgs.)	3/02	8/02	2/03	8/03	2/04	8/04
PCE	5.6	8.2	12	7.9	20	7.4
TCE	1.2	2	1.8	ND<1	1.4	1.3
1,1,1-TCA	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1
1,1-DCE	0.61J	ND<1	ND<1	ND<1	0.94J	0.4J
Freon 11	36	44	36	54	34	29
Freon 113	62	51	44	63	52	32
CFM	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1
MC	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
Benzene	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5

H-1	5/01
PCE	3200
TCE	670
1,1,1-TCA	280
1,1-DCE	1700
Freon 11	2700
Freon 113	6300
CFM	ND<50
MC	ND<100
Benzene	ND<50

OW-1 (62.5 - 77.5 feet bgs)	6/96	7/99	5/01	8/01	11/01	2/02	8/02	2/03	8/03	2/04	8/04
PCE	81000	23000	86000	54000	33000	30000	42,000	100,000	110,000	150,000	110,000
TCE	3400	1300	2400	2000	1200	1200	1,900	3,000	2,200	3,600	2,300
1,1,1-TCA	12000	2100	8900	5800	2200	2200	3,100	10,000	7,000	9,600	8,500
1,1-DCE	3600	1200	2700	2100	1300	1200	1,300	2,800	1,600	2,100	1,900
Freon 11	990	550	410	620	590	480	600	120	170	55	ND<400
Freon 113	1400	1300	720	1400	1400	1300	1,100	510	380	380J	ND<2,000
CFM	3200	400	500	380	280	280	320	500	360	81	ND<400
MC	15000	110	490	ND<500	21	ND<500	ND<1000	72	42	53	ND<2,000
Benzene	ND<500	10	15	ND<50	7.5	ND<50	ND<100	15	12	8.8	ND<200
Acetone	ND<10000	ND<10	ND<200	ND<1000	ND<10	ND<1000	ND<2000	ND<10	ND<10	ND<10	ND<4,000

H-3	
PCE	540
TCE	160
1,1,1-TCA	ND<50
1,1-DCE	550
Freon 11	880
Freon 113	2700
CFM	ND<50
MC	ND<100
Benzene	ND<50

H-4	
PCE	32000
TCE	1700
1,1,1-TCA	3200
1,1-DCE	3600
Freon 11	2900
Freon 113	5500
CFM	1400
MC	3100
Benzene	ND<500

OW-1B (110 - 120 feet bgs)	7/99	5/01	8/01	11/01	2/02	8/02	2/03	8/03	2/04	8/04
PCE	300	82	29	60	28	41	45	110	77	87
TCE	14	2.4	ND<1	5.6	ND<1	1.4	2.2	3.5	3.9	2.8
1,1,1-TCA	7.8	ND<1	ND<1	6	ND<1	ND<1	ND<1	1.5	0.3J	0.84J
1,1-DCE	13	ND<1	ND<1	1.6	ND<1	1.1	3.1	2.9	3.4	2.2
Freon 11	13	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	1.8	1
Freon 113	12	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	4.8J	2.5J
CFM	7.7	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	1.1	0.56J
MC	ND<10	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	0.8J	1.2J
Benzene	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.55	0.62	1.1	0.57	ND<0.5
Acetone	ND<10	16	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	5J	6.1J

MW01	
PCE	35E
TCE	360E
1,1,1-TCA	ND<0.5
1,1-DCE	30E
Freon 11	0.4J
Freon 113	3
CFM	ND<0.5
MC	ND<0.5
Benzene	ND<0.5

MW01B	
PCE	20J
TCE	190E
1,1,1-TCA	ND<0.5
1,1-DCE	15
Freon 11	0.2J
Freon 113	0.8
CFM	ND<0.5
MC	ND<0.5
Benzene	ND<0.5

OW-5 (30 - 50 feet bgs)	8/01	11/01	2/02	8/02	2/03	8/03	2/04	8/04
PCE	150	130	130	150	440	25	1,500	1,800
TCE	510	470	390	300	810	34	420	320
1,1,1-TCA	ND<2	ND<1	ND<1	ND<1	ND<1	ND<1	3.1	2.6
1,1-DCE	22	24	22	37	98	5.4	390	910
Freon 11	52	48	40	61	120	2.7	190	360
Freon 113	220	180	230	200	470	ND<5	450	900
CFM	ND<2.0	2.1	2	2.1	26	1.3	160	300
MC	ND<10	ND<5	ND<5	ND<5	ND<5	ND<5	20	29
c-1,2-DCE	31	26	30	34	97	3.6	33	14
Benzene	ND<1	ND<0.5	ND<0.5	ND<0.5	ND<0.53	ND<0.5	0.89	0.81

H-15	
PCE	200
TCE	40
1,1,1-TCA	-
1,1-DCE	140
Freon 11	57
Freon 113	220
CFM	40
MC	ND<2
Benzene	-

H-16	
PCE	71
TCE	3.6
1,1,1-TCA	-
1,1-DCE	2.4
Freon 11	ND<1
Freon 113	ND<2
CFM	ND<1
MC	ND<2
Benzene	-

H-17	
PCE	580
TCE	45
1,1,1-TCA	-
1,1-DCE	53
Freon 11	ND<1
Freon 113	ND<2
CFM	ND<1
MC	ND<2
Benzene	-

H-14	
PCE	95
TCE	520
1,1,1-TCA	-
1,1-DCE	34
Freon 11	49
Freon 113	260
CFM	ND<5
MC	ND<10
Benzene	-

MW02	
PCE	1900E
TCE	770E
1,1,1-TCA	20
1,1-DCE	1000
Freon 11	670E
Freon 113	1400E
CFM	780E
MC	ND<0.5
Benzene	ND<0.5

H-13	
PCE	1100
TCE	170
1,1,1-TCA	180
1,1-DCE	1700
Freon 11	960
Freon 113	2600
CFM	78
MC	ND<100
Benzene	ND<30

OW-6 (38 - 58 feet bgs)	5/01	8/01	11/01	2/02	8/02	2/03	8/03	2/04	8/04
PCE	28	24	140	69	21	72	22	17	18
TCE	4	ND<4	22	13	3.9	15	3.6	2.5	0.87J
1,1,1-TCA	ND<4	ND<4	2.9	1.3	ND<1	ND<1	ND<1	ND<1	ND<1
1,1-DCE	39	39	190	120	35	91	39	16	3.8
Freon 11	96	93	440	190	95	350	120	46	9.4
Freon 113	160	180	770	530	140	460	340	62	16
CFM	ND<4	ND<4	5.7	3.2	1.1	3.3	ND<1	0.83J	0.47J
MC	ND<20	ND<20	ND<5	ND<5	ND<5	ND<5	9.3	ND<5	1.9J
Benzene	2.8	2.5	1.7	2.4	0.86	1.1	0.57	ND<0.5	ND<0.5
MTBE	270	150	120	92	150	34	90	1.4	0.43J

H-10	
PCE	11
TCE	ND<5
1,1,1-TCA	ND<5
1,1-DCE	280
Freon 11	700
Freon 113	760
CFM	ND<5
MC	ND<20
Benzene	75

H-11	
PCE	920
TCE	120
1,1,1-TCA	380
1,1-DCE	2400
Freon 11	590
Freon 113	1500
CFM	ND<30
MC	ND<100
Benzene	ND<30

H-8	
PCE	9.5
TCE	ND<5
1,1,1-TCA	ND<5
1,1-DCE	ND<5
Freon 11	620
Freon 113	700
CFM	ND<5
MC	ND<20
Benzene	ND<5

OW-4A (49.8 - 69.8 feet bgs)	5/01	8/01	11/01	2/02	8/02	2/03	3/03	8/03	2/04	8/04
PCE	1000	1300	9.8	130	87	37	250	67	12	68
TCE	120	180	30	48	50	30	25	32	31	12
1,1,1-TCA	ND<20	21	ND<1	1.6	ND<1	ND<1	ND<1	ND<1	ND<1	0.3J
1,1-DCE	1500	2400	10	230	120	79	210	100	14	140
Freon 11	260	340	2.2	62	44	23	69	32	7	100
Freon 113	580	910	5.3	160	68	53	150	ND<5	11	230
CFM	39	62	32	33	37	21	13	21	22	6.4
MC	ND<100	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	1.1J
Benzene	ND<10	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5

OW-4B (112 - 122.3 feet bgs)	4/01	5/01	8/01	11/01	2/02	8/02	2/03	8/03	2/04	8/04
PCE	ND<1	1.2	1.2	1.9	1.9	12	41	33	14	1.6
TCE	ND<1	ND<1	ND<1	ND<1	ND<1	7.9	3.7	3	0.31J	ND<1
1,1,1-TCA	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1
1,1-DCE	ND<1	ND<1	ND<1	1.2	ND<1	22	14	12	1.4	ND<1
Freon 11	ND<1	ND<1	ND<1	ND<1	ND<1	14	ND<1	2	ND<1	ND<1
Freon 113	ND<5	ND<5	ND<5	ND<5	ND<5	86	30	30	4.2J	ND<5
CFM	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1
MC	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	1.5J
Benzene	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.8	0.79	1	ND<0.5	ND<0.5
Acetone	28	120	470	1500	280	240	220	46	8.4J	5.2J

H-9	
PCE	2200
TCE	180
1,1,1-TCA	270
1,1-DCE	3400
Freon 11	630
Freon 113	2100
CFM	ND<30
MC	ND<100
Benzene	ND<30
Acetone	ND<500

ACRONYMS

PCE	=	TETRACHLOROETHENE
TCE	=	TRICHLOROETHENE
1,1,1-TCA	=	1,1,1-TRICHLOROETHANE
1,1-DCE	=	1,1-DICHLOROETHENE
Freon 11	=	TRICHLOROFLUOROMETHANE
Freon 113	=	TRICHLOROTRIFLUOROETHANE
CFM	=	CHLOROFORM
MC	=	METHYLENE CHLORIDE
MTBE	=	METHYL-TERT-BUTYL-ETHER
c-1,2-DCE	=	cis-1,2-DICHLOROETHENE
J	=	ESTIMATED CONCENTRATION
E	=	ESTIMATED CONCENTRATION EXCEEDING UPPER CALIBRATION RANGE
ND	=	NOT DETECTED

ALL CONCENTRATIONS IN MICROGRAMS PER LITER (ug/L).
PERFORATED INTERVAL SHOWN IMMEDIATELY BELOW WELL NUMBER

LEGEND

H-6 ⊗ HYDROPUNCH SAMPLE LOCATION
OW-3 ▲ GROUNDWATER MONITORING WELL LOCATION (SCREENED INTERVAL)
MW02 ⊘ EPA WELL
1600/5800 ORIGINAL/DUPLICATE SAMPLE RESULTS IF >20% DIFFERENCE

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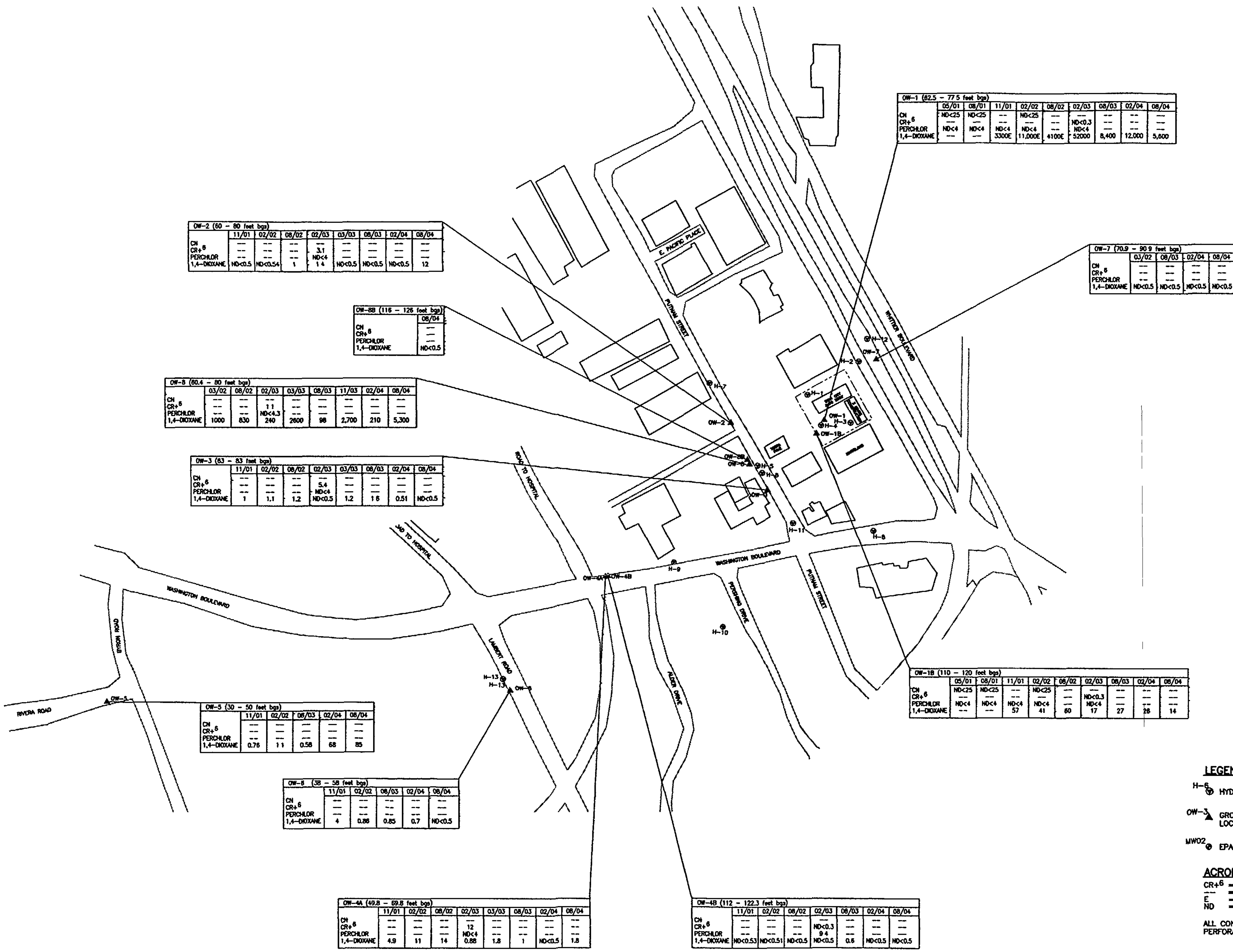
Groundwater Analytical Results for Selected VOCs

Figure 3-19



OW-1 (82.5 – 77.5 feet bgs)	05/01	08/01	11/01	02/02	08/02	02/03	08/03	02/04	08/04
CN	ND<25	ND<25	--	ND<25	--	--	--	--	--
$CR+^6$	--	--	--	--	--	ND<0.3	--	--	--
PERCHLOR	ND<4	ND<4	ND<4	ND<4	--	ND<4	--	--	--
1,4-DIOXANE	--	--	3300E	11,000E	4100E	52000	8,400	12,000	5,600

OW-7 (70.9 – 90.9 feet bgs)	03/02	08/03	02/04	08/04
CN	--	--	--	--
$CR+^6$	--	--	--	--
PERCHLOR	--	--	--	--
1,4-DIOXANE	ND<0.5	ND<0.5	ND<0.5	ND<0.5

OW-2 (60 – 80 feet bgs)	11/01	02/02	08/02	02/03	03/03	08/03	02/04	08/04
CN	--	--	--	--	--	--	--	--
$CR+^6$	--	--	--	3.1	--	--	--	--
PERCHLOR	--	--	--	ND<4	--	--	--	--
1,4-DIOXANE	ND<0.5	ND<0.54	1	1.4	ND<0.5	ND<0.5	ND<0.5	12

OW-8B (116 – 126 feet bgs)	08/04
CN	--
$CR+^6$	--
PERCHLOR	--
1,4-DIOXANE	ND<0.5

OW-8 (60.4 – 80 feet bgs)	03/02	08/02	02/03	03/03	08/03	11/03	02/04	08/04
CN	--	--	--	--	--	--	--	--
$CR+^6$	--	--	1.1	--	--	--	--	--
PERCHLOR	--	--	ND<4.3	--	--	--	--	--
1,4-DIOXANE	1000	830	240	2600	98	2,700	210	5,300

OW-3 (63 – 83 feet bgs)	11/01	02/02	08/02	02/03	03/03	08/03	02/04	08/04
CN	--	--	--	--	--	--	--	--
$CR+^6$	--	--	--	5.4	--	--	--	--
PERCHLOR	--	--	--	ND<4	--	--	--	--
1,4-DIOXANE	1	1.1	1.2	ND<0.5	1.2	1.6	0.51	ND<0.5

OW-1B (110 – 120 feet bgs)	05/01	08/01	11/01	02/02	08/02	02/03	08/03	02/04	08/04
CN	ND<25	ND<25	--	ND<25	--	--	--	--	--
$CR+^6$	--	--	--	--	--	ND<0.3	--	--	--
PERCHLOR	ND<4	ND<4	ND<4	ND<4	--	ND<4	--	--	--
1,4-DIOXANE	--	--	57	41	60	17	27	28	14

OW-5 (30 – 50 feet bgs)	11/01	02/02	08/03	02/04	08/04
CN	--	--	--	--	--
$CR+^6$	--	--	--	--	--
PERCHLOR	--	--	--	--	--
1,4-DIOXANE	0.76	1.1	0.58	68	85

OW-6 (38 – 58 feet bgs)	11/01	02/02	08/03	02/04	08/04
CN	--	--	--	--	--
$CR+^6$	--	--	--	--	--
PERCHLOR	--	--	--	--	--
1,4-DIOXANE	4	0.86	0.85	0.7	ND<0.5

OW-4A (49.8 – 69.8 feet bgs)	11/01	02/02	08/02	02/03	03/03	08/03	02/04	08/04
CN	--	--	--	--	--	--	--	--
$CR+^6$	--	--	--	12	--	--	--	--
PERCHLOR	--	--	--	ND<4	--	--	--	--
1,4-DIOXANE	4.9	11	14	0.88	1.8	1	ND<0.5	1.8

OW-4B (112 – 122.3 feet bgs)	11/01	02/02	08/02	02/03	08/03	02/04	08/04
CN	--	--	--	--	--	--	--
$CR+^6$	--	--	--	ND<0.3	--	--	--
PERCHLOR	--	--	--	9.4	--	--	--
1,4-DIOXANE	ND<0.53	ND<0.51	ND<0.5	ND<0.5	0.6	ND<0.5	ND<0.5

LEGEND

H-6 HYDROPUNCH SAMPLE LOCATION

OW-3 GROUNDWATER MONITORING WELL LOCATION (SCREENED INTERVAL)

MW02 EPA WELL

N

APPROXIMATE SCALE
1" = 200'
100 0 200

ACRONYMS

$CR+^6$ = HEXAVALENT CHROMIUM
--- = NOT ANALYZED
E = ESTIMATED
ND = NOT DETECTED

ALL CONCENTRATIONS IN MICROGRAMS PER LITER (ug/L)
PERFORATED INTERVAL SHOWN IMMEDIATELY BELOW WELL NUMBER

DATE Jan 10, 2005 XREFS OMEGA_NAD8325 USER negretegd
DWG. P:\10500\0Cad\Phase1a Addendum\Omega-RPT-Fig3-20-EmrgngCmpnds.dwg

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Groundwater Analytical Results
Emerging Compounds

Figure 3-20

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Figure 3-21
Omega Site Phase 1a Area
Well and Cross-Section Locations

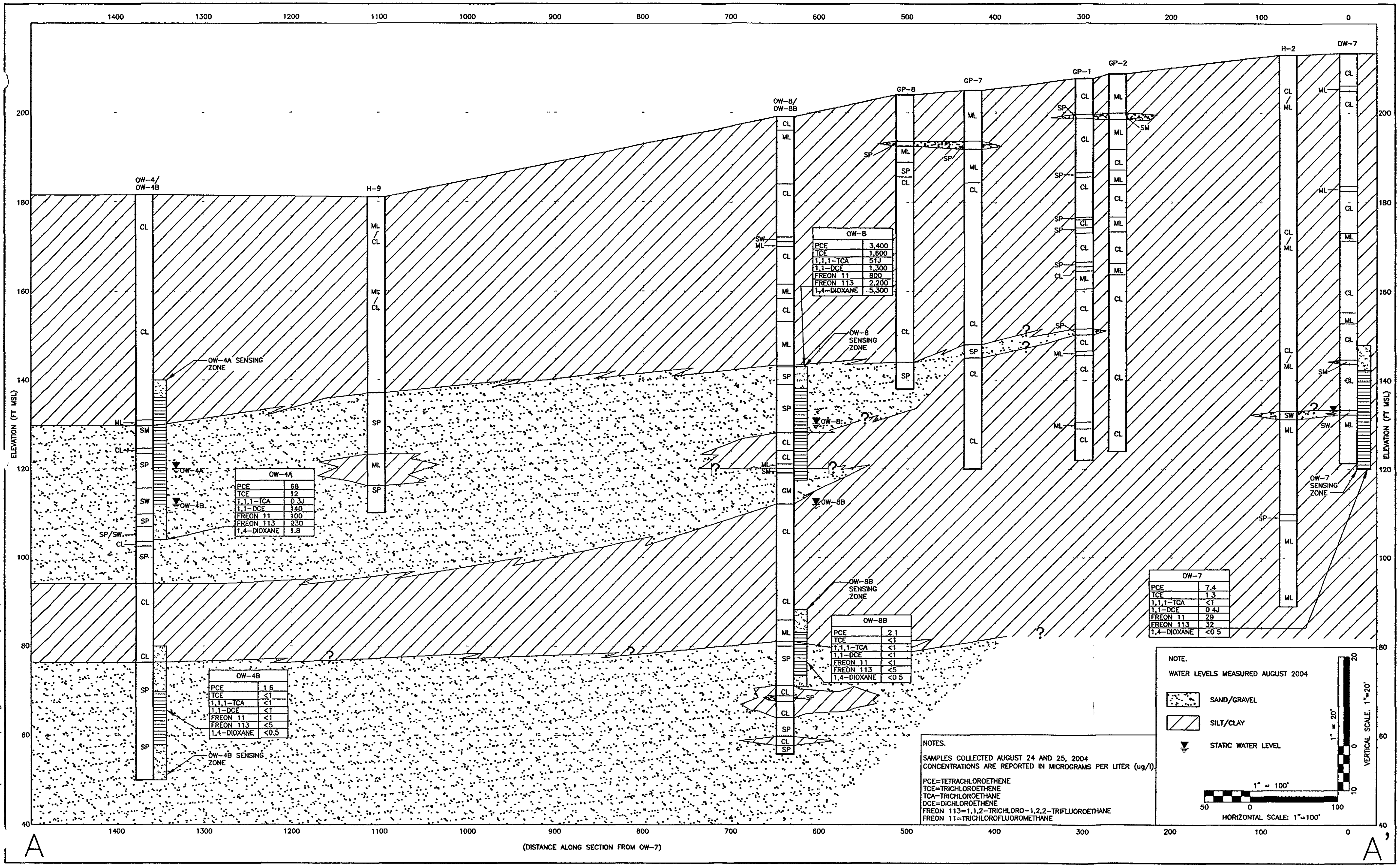

Figure 3-22
Omega Site Cross-Section A-A'

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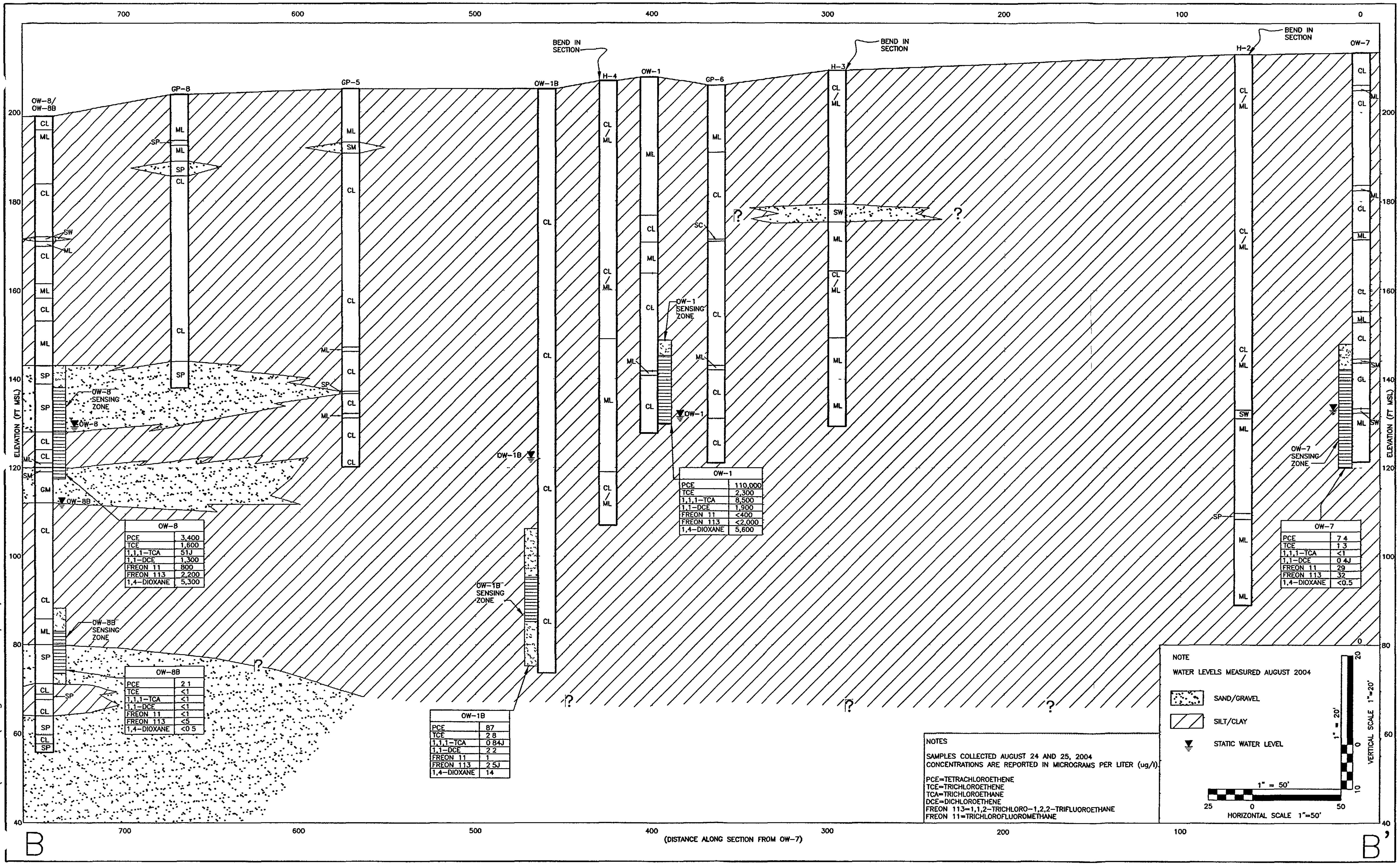


OW-8	
PCE	3,400
TCE	1,600
1,1,1-TCA	51J
1,1-DCE	1,300
FREON 11	800
FREON 113	2,200
1,4-DIOXANE	5,300

OW-8B	
PCE	2 1
TCE	<1
1,1,1-TCA	<1
1,1-DCE	<1
FREON 11	<1
FREON 113	<5
1,4-DIOXANE	<0 5

OW-1B	
PCE	87
TCE	2 8
1,1,1-TCA	0 84J
1,1-DCE	2 2
FREON 11	1
FREON 113	2 5J
1,4-DIOXANE	14

OW-1	
PCE	110,000
TCE	2,300
1,1,1-TCA	8,500
1,1-DCE	1,900
FREON 11	<400
FREON 113	<2,000
1,4-DIOXANE	5,600

OW-7	
PCE	7 4
TCE	1 3
1,1,1-TCA	<1
1,1-DCE	0 4J
FREON 11	29
FREON 113	32
1,4-DIOXANE	<0.5

0500\37240\ Fig3-23 03/01/05 13:57 reddi

Figure 3-23
Omega Site Cross-Section B-B'

CDM

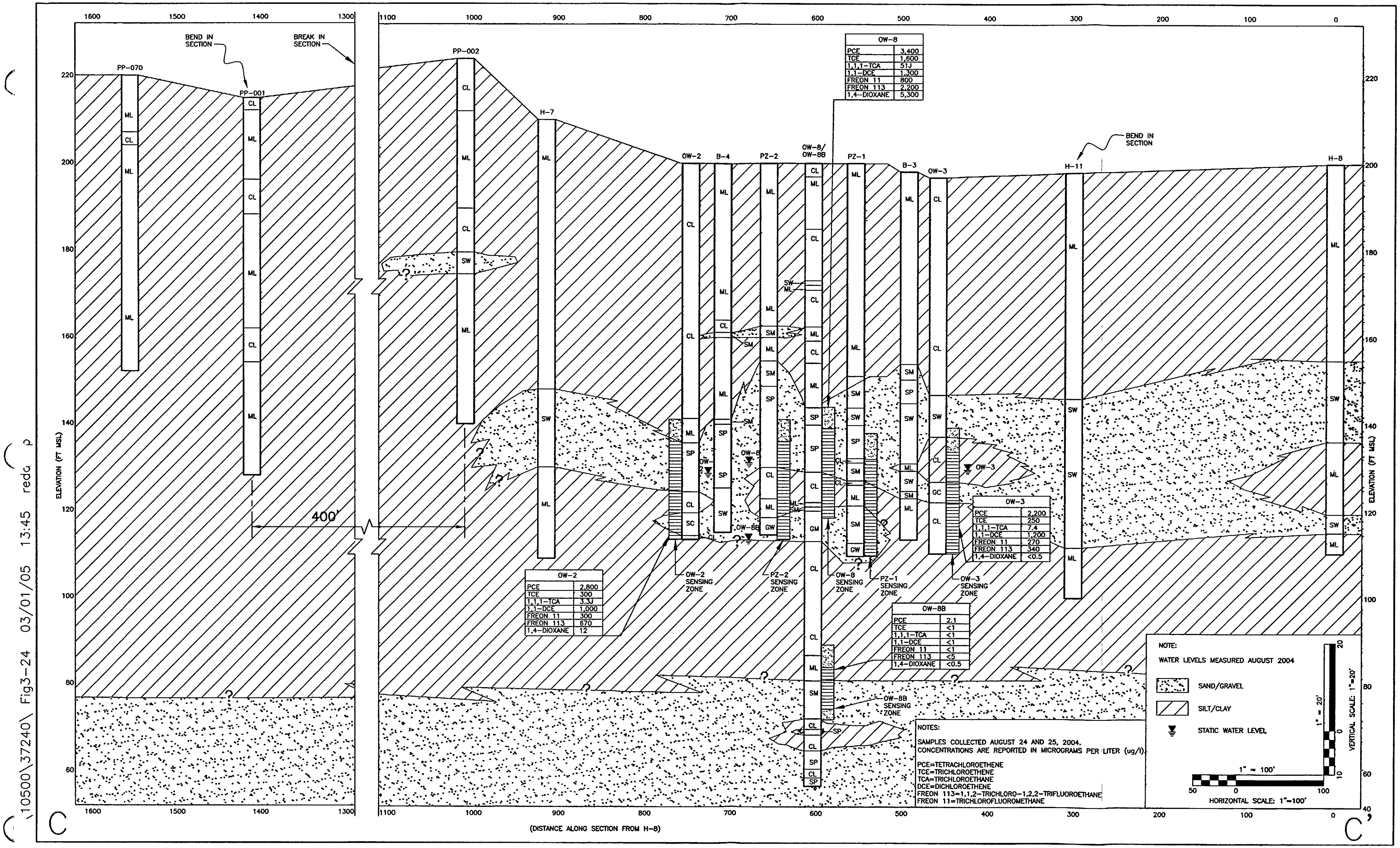
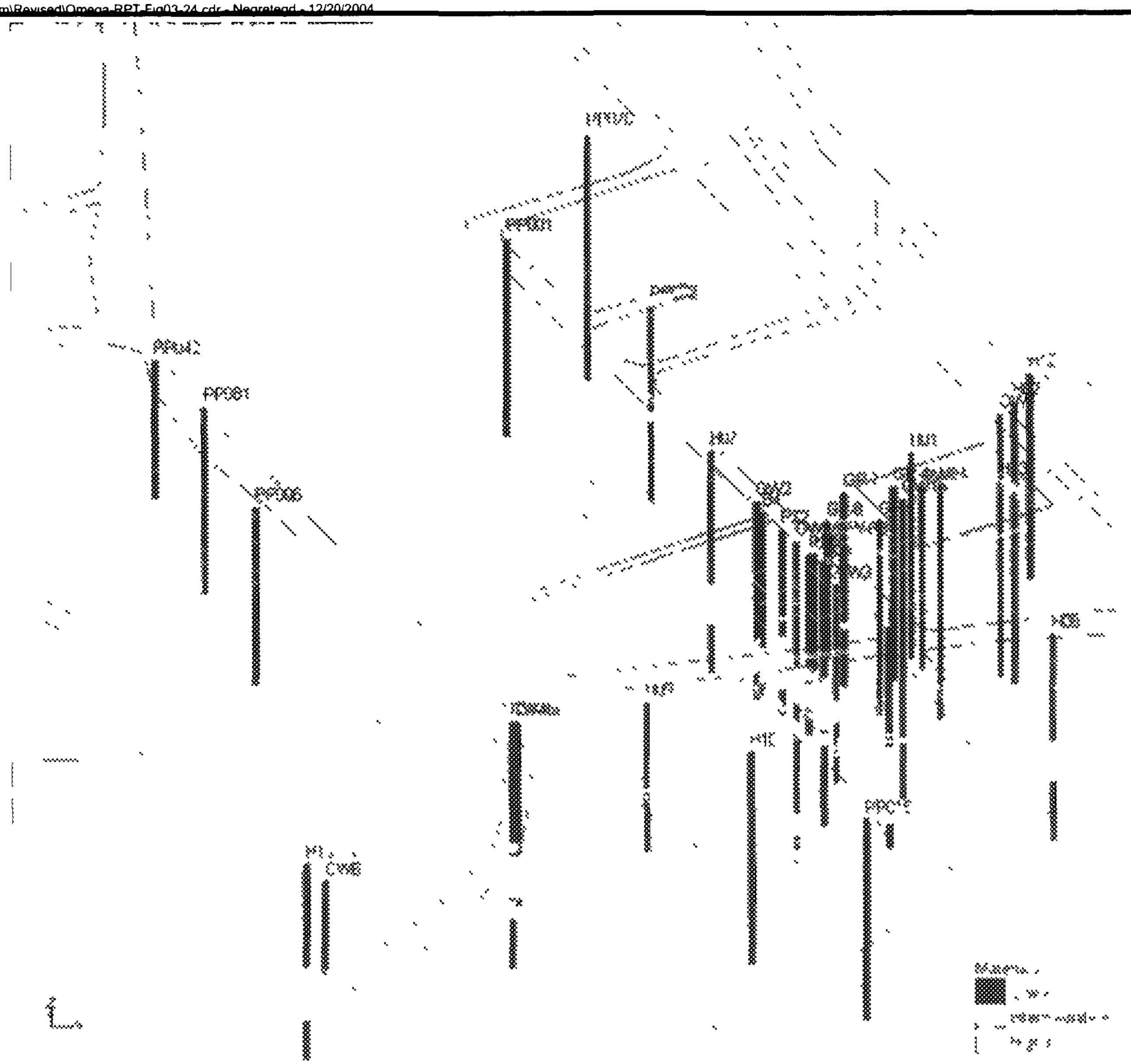


Figure 3-24
Omega Site Cross-Section C-C'

CDM



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Three-Dimensional View of Lithology

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Figure 3-25

Ta[illegible]-1
Omega Chemi[illegible]uperfund Site
Well Construction Details

Well No.	Casing Dia. (inches)	Boring diameter (inches)	TD drilled (feet bgs)	Blank Casing Type	Screen Type	Screened Interval (feet bgs)	Opening Size (inch)	Filter Pack Gradation	Filter Pack Interval	Date Drilled	TD Cased (feet bgs)	Northing feet	Easting feet	GS Elevation (feet msl)	Reference Point Elev. (feet msl)	Reference Point (casing)
OW1	4	10	80	PVC	SS/WW	62.5-77.5	0.020	#2/12	59-77.5	Jun-96	80	4101351.3	4274702.0	207.79	210.3	top of PVC
OW1b*	4	10	130	MS	SS/WW	110-120	0.020	#2/12	99-130	Jun-99	120	4101331.7	4274666.4	205.18	204.98	top of steel
OW2	4	10	85	MS	SS/WW	60-80	0.020	#2/12	55-85	Jun-99	80	4101362.0	4274396.2	201.04	200.1	top of steel
OW3	4	10	85	MS	SS/WW	63-83	0.020	#2/12	55-85	Jun-99	83	4101113.0	4274538.0	196.88	196.33	top of steel
OW4a	4	10	80	MS	SS/WW	49.8-69.8	0.020	#2/12	44.7-75.7	Mar-01	75	4100784.2	4273942.3	182.73	182.47	top of steel
OW4b	4	10	132	MS	SS/WW	112-122.3	0.020	#2/12	109.5-132	Mar-01	127.2	4100782.7	4273932.3	182.63	182.22	top of steel
OW5	4	10	52	MS	SS/WW	30-50	0.020	#2/12	25-51	Aug-01	50	4100291.9	4272058.3	152.68	151.96	top of steel
OW6	4	10	61.5	MS	SS/WW	38-58	0.020	#2/12	36-59	Mar-01	58	4100352.7	4273577.3	170.94	170.54	top of steel
OW7	4	10	92	MS	SS/WW	70.9-90.9	0.020	#2/12	65-92.5	Mar-02	90.9	4101548.4	4274850.7	213.34	212.01	top of steel
OW8	4	10	81	MS	SS/WW	60.4-80.0	0.020	#2/12	55-81	Mar-02	80	4101239.5	4274466.7	199.03	198.42	top of steel
OW8b*	4	10	143	PVC	SS/WW	116-126	0.010	#2/12	111.3-128	Aug-04	126	4101250.4	4274461.4	199.27	198.65	top of PVC
PZ1	2	6	90	PVC	PVC/slot	68-88	0.020	#2/12	62.5-88	Nov-03	88	4101198.5	4274490.2	198.41	198.04	top of PVC
PZ2	2	6	85	PVC	PVC/slot	64-84	0.020	#2/12	59.2-84	Nov-03	84	4101284.3	4274441.7	199.83	199.29	top of PVC

bgs - feet below ground surface
msl - feet above Mean Sea Level
GS - Ground Surface
TD - Total Depth

Dia. - Diameter
SS - stainless steel
WW - continuous wire wrap screen
MS - Mild Steel

PVC - polyvinylchloride
slot - slotted PVC casing

Note: northing and easting data per California Coordinate System NAD27
* Wells OW1b and OW8b also include 12-inch diameter mild steel conductor casing to 90 and 91.4 feet bgs, respectively.

UTM Coordinates Zone 11, NAD 83 (meters) as follows:

	Northing	Easting
OW1	3759242.1	403554.4
OW1b	3759236.3	403543.4
OW2	3759246.6	403461.2
OW3	3759170.1	403503.4
OW4a	3759072.3	403320.6
OW4b	3759071.9	403317.6
OW5	3758929.8	402744.6
OW6	3758942.3	403207.7
OW7	3759301.6	403600.4
OW8	3759209.0	403482.2
OW8b	3759212.3	403480.6
PZ1	3759196.4	403489.2
PZ2	3759222.7	403474.8

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Groundwater Elevation Summary

Date	Well ID	OW-1	OW-1b	OW-2	OW-3	OW-4a	OW-4b	0W-5	0W-6	OW-7	OW-8	OW8-b
	TOC Elev (ft MSL)	210 30	204 98	200 10	196 33	182 47	182 22	151 96	170 54	212 01	198 42	198 65
05/15/2001	DTW (ft btoc)	74 19	72 30	66 47	62 55	53 60	57 11	--	--	--	--	--
	GW Elev (ft MSL)	**136.11**	**132.68**	**133.63**	**133.78**	**128.87**	**125.11**	--	--	--	--	--
06/14/2001	DTW (ft btoc)	74 14	72 53	66 38	62 44	53 36	57 51	--	--	--	--	--
	GW Elev (ft MSL)	**136.16**	**132.45**	**133.72**	**133.89**	**129.11**	**124.71**	--	--	--	--	--
07/24/2001	DTW (ft btoc)	74 04	73 36	66 25	62 29	53 31	58 82	--	--	--	--	--
	GW Elev (ft MSL)	**136.26**	**131.62**	**133.85**	**134.04**	**129.16**	**123.40**	--	--	--	--	--
08/16/2001	DTW (ft btoc)	74 08	74 18	66 34	62 39	53 70	60 01	26 14	42 54	--	--	--
	GW Elev (ft MSL)	**136.22**	**130.80**	**133.76**	**133.94**	**128.77**	**122.21**	**125.82**	**128.00**	--	--	--
09/18/2001	DTW (ft btoc)	74 33	74 75	66 66	62 70	54 35	60 82	27 33	43 25	--	--	--
	GW Elev (ft MSL)	**135.97**	**130.23**	**133.44**	**133.63**	**128.12**	**121.40**	**124.63**	**127.29**	--	--	--
10/18/2001	DTW (ft btoc)	74 84	74 83	66 95	62 98	54 76	60 98	27 59	43 69	--	--	--
	GW Elev (ft MSL)	**135.46**	**130.15**	**133.15**	**133.35**	**127.71**	**121.24**	**124.37**	**126.85**	--	--	--
11/15/2001	DTW (ft btoc)	74 38	75 49	66 92	62 95	54 87	61 67	28 18	43 95	--	--	--
	GW Elev (ft MSL)	**135.92**	**129.49**	**133.18**	**133.38**	**127.60**	**120.55**	**123.78**	**126.59**	--	--	--
12/14/2001	DTW (ft btoc)	74 80	75 05	67 28	63 33	55 43	60 76	28 24	44 41	--	--	--
	GW Elev (ft MSL)	**135.50**	**129.93**	**132.82**	**133.00**	**127.04**	**121.46**	**123.72**	**126.13**	--	--	--
01/18/2002	DTW (ft btoc)	74 92	74 12	67 40	63 52	55 55	59 53	27 44	44 39	--	--	--
	GW Elev (ft MSL)	**135.38**	**130.86**	**132.70**	**132.81**	**126.92**	**122.69**	**124.52**	**126.15**	--	--	--
02/14/2002	DTW (ft btoc)	74 86	73 56	67 31	63 36	55 21	58 81	26 73	44 00	--	--	--
	GW Elev (ft MSL)	**135.44**	**131.42**	**132.79**	**132.97**	**127.26**	**123.41**	**125.23**	**126.54**	--	--	--
03/13/2002	DTW (ft btoc)	75 13	74 52	67 50	63 58	55 30	59 34	26 75	44 01	74 83	65 61	--
	GW Elev (ft MSL)	**135.17**	**130.46**	**132.60**	**132.75**	**127.17**	**122.88**	**125.21**	**126.53**	**137.18**	**132.81**	--
04/19/2002	DTW (ft btoc)	75 16	NM	67 52	63 61	55 35	60 02	27 12	44 12	74 93	65 69	--
	GW Elev (ft MSL)	**135.14**	**NM**	**132.58**	**132.72**	**127.12**	**122.20**	**124.84**	**126.42**	**137.08**	**132.73**	--
08/20/2002	DTW (ft btoc)	75 97	77 04	68 30	64 47	56 80	63 64	30 03	45 70	75 86	66 46	--
	GW Elev (ft MSL)	**134.33**	**127.94**	**131.80**	**131.86**	**125.67**	**118.58**	**121.93**	**124.84**	**136.15**	**131.96**	--
02/19/2003	DTW (ft btoc)	76 70	77 04	69 44	65 58	58 58	62 46	30 85	47 49	76 89	67 37	--
	GW Elev (ft MSL)	**133.60**	**127.94**	**130.66**	**130.75**	**123.89**	**119.76**	**121.11**	**123.05**	**135.12**	**131.05**	--
08/26/2003	DTW (ft btoc)	76 95	78 75	69 18	65 54	58 13	65 67	31 20	47 09	76 90	67 35	--
	GW Elev (ft MSL)	**133.35**	**126.23**	**130.92**	**130.79**	**124.34**	**116.55**	**120.76**	**123.45**	**135.11**	**131.07**	--
02/2004	DTW (ft btoc)	76 97	80 93	70 40	66 35	61 04	68 08	35 21	50 24	78 00	68 36	--
	GW Elev (ft MSL)	**133.33**	**124.05**	**129.70**	**129.98**	**121.43**	**114.14**	**116.75**	**120.30**	**134.01**	**130.06**	--
08/2004	DTW (ft btoc)	78 84	82 80	71 24	67 13	62 36	71 10	36 78	51 69	78 96	69 15	86 77
	GW Elev (ft MSL)	**131.46**	**122.18**	**128.86**	**129.20**	**120.11**	**111.12**	**115.18**	**118.85**	**133.05**	**129.27**	**111.88**

TOC - Top of Casing
Elev - Elevation
ft MSL - feet mean sea level
DTW - Depth to Water
ft btoc - feet below top of casing
GW Elev - Groundwater Elevation
Note February 2004 measurements collected February 24, 25 and 27 August 2004 measurements collected August 24 through 26

Table 3-3
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval	Sample Date	Sample Type	PCE (5)	TCE (5)	1,1,1-TCA (200)	1,1,2-TCA (5)	PCA	1,1-DCE (6)	cis-1,2-DCE (6)	trans-1,2-DCE (10)	1,1-DCA (5)	1,2-DCA (0.5)	1,2-DCB (600)	1,4-DCB (5)	CBN (70)	CTC (0.5)	CFM (80)	MC (5)	Freon 113 (1200)	Freon 11 (150)	Freon 12 (1000#)	VC (0.5)
OW1 62.5 - 77.5																						
	06/06/1996	ORIG	81000	3400	12000	500 U		3600	500 U	500 U	500 U	2600	500 U	500 U	500 U	500 U	3200	15000	1400	990		500 U
	07/02/1999	ORIG	23000	1300	2100	4.6	2.6	1200	5.4	160	86	120	0.97	1 U	2	3.6	400	110	1300	550	5 U	2.1
	05/16/2001	ORIG	86000	2400	8900	20 U	20 U	2700	20 U	100	130	87	20 U	20 U	20 U	10 U	500	490	720	410	100 U	10 U
	05/16/2001	N	3.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	08/17/2001	ORIG	54000	2000	5800	100 U	100 U	2100	100 U	100 U	100 U	62	100 U	100 U	100 U	50 U	380	500 U	1400	620	500 U	50 U
	11/15/2001	ORIG	33000	1200	2200	2.2	4.7	1300	4	74	54	40	1 U	1 U	1.8	0.5 U	280	21	1400	590	5 U	0.5 U
	02/14/2002	ORIG	30000	1200	2200	100 U	100 U	1200	100 U	100 U	100 U	50 U	100 U	100 U	100 U	50 U	280	500 U	1300	480	500 U	50 U
	08/20/2002	ORIG	42000	1900	3100	200 U	200 U	1300	200 U	200 U	200 U	100 U	200 U	200 U	200 U	100 U	320	1000 U	1100	600	1000 U	100 U
	08/20/2002	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	02/19/2003	ORIG	100000	3000	10000	4.7	32	2600	8.6	39	88	84	15	3	7.8	0.5 U	500	72	510	120	5 U	0.5 U
	08/26/2003	ORIG	110000	2200	7000	1.4	19	1600	7.2	43	71	53	4.5	1.2	4.1	0.5 U	360	42	380	170	5 U	0.5 U
	02/24/2004	ORIG	150000	3600	9600	0.58 J	12	2100	4.5	21	52	22	7	1.7	3.4	1	81	53	380 J	55	5 U	0.64
	08/27/2004	ORIG	110000	2300	8500	400 U	400 U	1900	400 U	400 U	400 U	200 U	400 U	400 U	400 U	200 U	400 U	2000 U	2000 U	400 U	2000 U	200 U
	08/27/2004	DUP	150000	3500	12000	0.35 J	5.3	2000	4.6	15	45	12	3.8	0.89 J	1.9	0.44 J	59	41	150	22	5 U	0.5 U
OW1b 110 - 120																						
	07/02/1999	ORIG	180 R	11	7.4	0.5 U	1 U	11	0.5 U	0.65	2.4	8.8	0.5 U	1 U	1 U	0.5 U	6.6	10 U	12	2.9	5 U	0.5 U
	07/02/1999	N	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	1 U	0.5 U	1 U	10 U	5 U	0.5 U	5 U	0.5 U
	07/02/1999	DUP	300	14	7.8	0.5 U	1 U	13	0.5 U	0.78	2.8	10	0.5 U	1 U	1 U	0.5 U	7.7	10 U	12	3	5 U	0.5 U
	05/16/2001	ORIG	62	2.4	1 U	1 U	1 U	1.9	2.7	1 U	1 U	2.9	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	05/16/2001	DUP	56	1.9	1 U	1 U	1 U	1 U	2.4	1 U	1 U	2.2	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	08/17/2001	ORIG	29	1 U	1 U	1 U	1 U	1 U	1.7	1 U	1 U	1.2	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	11/16/2001	ORIG	60	5.6	6	1 U	1 U	1.6	1.4	1 U	1 U	1	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	02/14/2002	ORIG	28	1 U	1 U	1 U	1 U	1 U	1.1	1 U	1 U	0.69	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	08/20/2002	ORIG	41	1.4	1 U	1 U	1 U	1.1	1 U	1 U	1 U	0.76	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	02/19/2003	ORIG	45	2.2	1 U	1 U	1 U	3.1	1 U	1 U	1 U	0.64	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.6
	08/26/2003	ORIG	110	3.5	1.5	1 U	1 U	2.9	1 U	1 U	1 U	1.4	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	02/24/2004	ORIG	77	3.9	0.3 J	1 U	1 U	3.4	0.45 J	1 U	0.43 J	0.87	1 U	1 U	1 U	0.5 U	1.1	0.8 J	4.8 J	1.8	5 U	0.5 U
	08/27/2004	ORIG	87	2.8	0.84 J	1 U	1 U	2.2	1 U	1 U	1 U	0.41 J	1 U	1 U	1 U	0.5 U	0.59 J	1.2 UJB	2.5 J	1	5 U	0.5 U

Table 3-3
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval	Sample Date	Sample Type	PCE (5)	TCE (5)	1,1,1-TCA (200)	1,1,2-TCA (5)	PCA	1,1-DCE (6)	cis-1,2-DCE (6)	trans-1,2-DCE (10)	1,1-DCA (5)	1,2-DCA (0.5)	1,2-DCB (600)	1,4-DCB (5)	CBN (70)	CTC (0.5)	CFM (80)	MC (5)	Freon 113 (1200)	Freon 11 (150)	Freon 12 (1000#)	VC (0.5)
OW2 60 - 80																						
	07/02/1999	ORIG	1300	240	8.5	2 U	4 U	680	2 U	2 U	2.8	2 U	2 U	4 U	4 U	2 U	4 U	40 U	2600	610	20 U	2 U
	05/15/2001	ORIG	780	150	10 U	10 U	10 U	500	10 U	10 U	10 U	5 U	10 U	10 U	10 U	5 U	10 U	50 U	1100	370	50 U	5 U
	08/17/2001	ORIG	620	110	2	1 U	1 U	360	1 U	1 U	1.1	0.5 U	1 U	1 U	1 U	0.57	1 U	5 U	1400	330	5 U	0.5 U
	11/16/2001	ORIG	730	130	2 6	1 U	1 U	390	1 U	1 U	1.5	0.5 U	1 U	1 U	1 U	0.61	1 U	5 U	1600	390	5 U	0.5 U
	02/15/2002	ORIG	710	110	2.1	1 U	1 U	350	1 U	1 U	1.5	0.5 U	1 U	1 U	1 U	0.79	1.2	5 U	1400	380	5 U	0.5 U
	08/21/2002	ORIG	610	120	4 U	4 U	4 U	350	4 U	4 U	4 U	2 U	4 U	4 U	4 U	2 U	4 U	20 U	1400	310	20 U	2 U
	02/19/2003	ORIG	1300	150	5.9	1 U	1 U	790	1 U	1 U	1.9	0.5 U	1 U	1 U	1 U	0.5 U	1.9	5 U	820	280	5 U	0.5 U
	03/10/2003	ORIG	1400	160	3.7	2 U	2 U	680	2 U	2 U	2.1	1 U	2 U	2 U	2 U	1 U	2.5	10 U	660	240	10 U	1 U
	08/27/2003	ORIG	2000	230	5 U	5 U	5 U	870	5 U	5 U	5 U	2.5 U	5 U	5 U	5 U	2.5 U	5 U	25 U	750	290	25 U	2.5 U
	02/24/2004	ORIG	2500	200	4.2 J	5 U	5 U	930	5 U	5 U	2.5 J	2.5 U	5 U	5 U	5 U	2.5 U	3.4 J	25 U	420	180	25 U	2.5 U
	08/24/2004	ORIG	2800	300	3.3 J	10 U	10 U	1000	10 U	10 U	2.9 J	5 U	10 U	10 U	10 U	5 U	4.4 J	50 U	670	300	50 U	5 U
OW3 63 - 83																						
	07/02/1999	ORIG	670	170	28	2 U	4 U	1200	2 U	2 U	2 U	2 U	2 U	4 U	4 U	2 U	4 U	40 U	800	410	20 U	2 U
	05/16/2001	ORIG	2100	270	33	20 U	20 U	1700	20 U	20 U	20 U	10 U	20 U	20 U	20 U	10 U	20 U	100 U	430	380	100 U	10 U
	08/17/2001	ORIG	1800	200	22	4 U	4 U	1500	4 U	4 U	4 U	2 U	4 U	4 U	4 U	2 U	12	20 U	520	330	20 U	2 U
	11/15/2001	ORIG	1300	180	17	1 U	1 U	1200	1 U	1 U	1.6	0.5 U	1 U	1 U	1 U	0.66	6.5	5 U	530	300	5 U	0 5 U
	02/15/2002	ORIG	1400	180	14	4 U	4 U	1100	4 U	4 U	4 U	2 U	4 U	4 U	4 U	2 U	7.7	20 U	530	280	20 U	2 U
	08/20/2002	ORIG	200	160	12	4 U	4 U	130	4 U	4 U	4 U	2 U	4 U	4 U	4 U	2 U	7.4	20 U	360	230	20 U	2 U
	02/20/2003	ORIG	1500	170	9 5	4 U	4 U	1100	4 U	4 U	4 U	2 U	4 U	4 U	4 U	2 U	7	20 U	450	320	20 U	2 U
	02/20/2003	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	03/13/2003	ORIG	1800	170	8.9	4 U	4 U	1400	4 U	4 U	4 U	2 U	4 U	4 U	4 U	2 U	6.8	20 U	430	250	20 U	2 U
	08/26/2003	ORIG	2100	190	9.4	1 U	1 U	1100	1 U	1 U	2	0.5 U	1 U	1 U	1 U	0.5 U	9.5	5 U	370	300	5 U	0.5 U
	02/25/2004	ORIG	2800	260	11	10 U	10 U	1500	10 U	10 U	2.8 J	5 U	10 U	10 U	10 U	5 U	14	50 U	390	230	50 U	5 U
	02/25/2004	DUP	3200	290	12	10 U	10 U	1700	10 U	10 U	3.7 J	5 U	10 U	10 U	10 U	5 U	16	8.3 J	400	290	50 U	5 U
	08/24/2004	ORIG	2200	250	7 4	5 U	5 U	1200	5 U	5 U	2.6 J	2.5 U	5 U	5 U	5 U	2.5 U	16	12 J	340	270	25 U	2.5 U
OW4A 49.8 - 69.8																						
	05/16/2001	ORIG	1000	120	20 U	20 U	20 U	1500	20 U	20 U	20 U	10 U	20 U	20 U	20 U	10 U	39	100 U	580	260	100 U	10 U
	08/16/2001	ORIG	1300	180	21	1 U	1 U	2400	1 U	1 U	1.7	3.5	1 U	1 U	1 U	1	62	5 U	910	340	5.8	0.5 U

Table 3-3
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval	Sample Date	Sample Type	PCE (5)	TCE (5)	1,1,1-TCA (200)	1,1,2-TCA (5)	PCA	1,1-DCE (6)	cis-1,2-DCE (6)	trans-1,2-DCE (10)	1,1-DCA (5)	1,2-DCA (0.5)	1,2-DCB (600)	1,4-DCB (5)	CBN (70)	CTC (0.5)	CFM (80)	MC (5)	Freon 113 (1200)	Freon 11 (150)	Freon 12 (1000#)	VC (0.5)
	11/16/2001	ORIG	9.8	30	1 U	1 U	1 U	10	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	32	5 U	5.3	2.2	5 U	0.5 U
	11/16/2001	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	02/15/2002	ORIG	130	48	1.6	1 U	1 U	230	1 U	1 U	1 U	0.69	1 U	1 U	1 U	0.5 U	33	5 U	160	62	5 U	0.5 U
	02/15/2002	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	08/21/2002	ORIG	87	50	1 U	1 U	1 U	120	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	37	5 U	88	44	5 U	0.5 U
	02/20/2003	ORIG	37	30	1 U	1 U	1 U	79	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	21	5 U	53	23	5 U	0.5 U
	03/14/2003	ORIG	250	25	1 U	1 U	1 U	210	1 U	1 U	1 U	0.77	1 U	1 U	1 U	0.5 U	13	5 U	150	69	5 U	0.5 U
	08/27/2003	ORIG	67	32	1 U	1 U	1 U	100	1 U	1 U	1 U	0.5	1 U	1 U	1 U	0.5 U	21	5 U	5 U	32	5 U	0.5 U
	02/27/2004	ORIG	12	31	1 U	1 U	1 U	14	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	22	5 U	11	7	5 U	0.5 U
	08/25/2004	ORIG	68	12	0.3 J	1 U	1 U	140	1 U	1 U	1 U	0.45 J	1 U	1 U	1 U	0.5 U	6.4	1.1 J	230	100	0.87 J	0.5 U
	08/25/2004	DUP	75	13	0.32 J	1 U	1 U	130	1 U	1 U	1 U	0.43 J	1 U	1 U	1 U	0.5 U	6.7	1 J	230	120	0.94 J	0.5 U
OW4B 112 - 122.3																						
	04/03/2001	ORIG	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	05/16/2001	ORIG	1.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	08/16/2001	ORIG	1.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	11/16/2001	ORIG	1.9	1 U	1 U	1 U	1 U	1.2	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	02/15/2002	ORIG	1.9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	08/21/2002	ORIG	12	7.9	1 U	1 U	1 U	22	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	86	14	5 U	0.5 U
	02/20/2003	ORIG	41	3.7	1 U	1 U	1 U	14	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	30	1 U	5 U	0.5 U
	08/27/2003	ORIG	33	3	1 U	1 U	1 U	12	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	30	2	5 U	0.5 U
	02/27/2004	ORIG	14	0.31 J	1 U	1 U	1 U	1.4	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	4.2 J	1 U	5 U	0.5 U
	08/25/2004	ORIG	1.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	1.5 J	5 U	1 U	5 U	0.5 U
OW5 30 - 50																						
	08/17/2001	ORIG	150	510	2 U	2 U	2 U	22	31	2 U	2 U	1 U	2 U	2 U	2 U	1 U	2 U	10 U	220	52	10 U	1 U
	08/17/2001	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	08/17/2001	DUP	190	550	1 U	1 U	1 U	35	36	1.4	1 U	0.5 U	1 U	1 U	1 U	0.5 U	2.4	5 U	240	66	5 U	0.5 U
	11/16/2001	ORIG	130	470	1 U	1 U	1 U	24	26	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	2.1	5 U	180	46	5 U	0.5 U
	11/16/2001	DUP	130	570	1 U	1 U	1 U	18	30	1.6	1 U	0.5 U	1 U	1 U	1 U	0.5 U	2.3	5 U	170	47	5 U	0.5 U
	02/15/2002	ORIG	130	390	1 U	1 U	1 U	22	30	1.3	1 U	0.5 U	1 U	1 U	1 U	0.5 U	2	5 U	230	40	5 U	0.5 U

Table 3-3
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval	Sample Date	Sample Type	PCE (5)	TCE (5)	1,1,1-TCA (200)	1,1,2-TCA (5)	PCA	1,1-DCE (6)	cis-1,2-DCE (6)	trans-1,2-DCE (10)	1,1-DCA (5)	1,2-DCA (0.5)	1,2-DCB (600)	1,4-DCB (5)	CBN (70)	CTC (0.5)	CFM (80)	MC (5)	Freon 113 (1200)	Freon 11 (150)	Freon 12 (1000#)	VC (0.5)
	02/15/2002	DUP	120	410	1 U	1 U	1 U	18	32	1.8	1 U	0.5 U	1 U	1 U	1 U	0.5 U	2.1	5 U	230	39	5 U	0.5 U
	08/22/2002	ORIG	150	300	1 U	1 U	1 U	37	34	1.2	1 U	0.5 U	1 U	1 U	1 U	0.5 U	2.1	5 U	200	61	5 U	0.5 U
	02/21/2003	ORIG	440	810	1 U	1 U	1 U	98	97	5.1	1 U	2.6	1 U	1 U	1 U	0.5 U	26	5 U	470	120	5 U	0.5 U
	08/28/2003	ORIG	25	34	1 U	1 U	1 U	5.4	3.6	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1.3	5 U	5 U	2.7	5 U	0.5 U
	02/24/2004	ORIG	1500	420	3.1	0.91 J	1 U	390	33	2.9	3.8	26	1 U	1 U	1 U	0.5 U	160	20	450	190	5 U	0.5 U
	08/25/2004	ORIG	1800	320	2.6	1.2	1 U	910	14	3.2	5.1	33	1 U	1 U	1 U	0.5 U	300	29	900	360	1.8 J	0.5 U
OW6	38 - 58																					
	05/16/2001	ORIG	28	4	4 U	4 U	4 U	39	4 U	4 U	4 U	2 U	4 U	4 U	4 U	2 U	4 U	20 U	160	96	20 U	2 U
	08/17/2001	ORIG	24	4 U	4 U	4 U	4 U	39	4 U	4 U	4 U	2 U	4 U	4 U	4 U	2 U	4 U	20 U	180	93	20 U	2 U
	11/16/2001	ORIG	140	22	2.9	1 U	1 U	190	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	5.7	5 U	770	440	5 U	0.5 U
	02/15/2002	ORIG	69	13	1.3	1 U	1 U	120	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1.1	3.2	5 U	530	190	5 U	0.5 U
	08/21/2002	ORIG	21	3.9	1 U	1 U	1 U	35	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1.1	5 U	140	95	5 U	0.5 U
	02/21/2003	ORIG	72	15	1 U	1 U	1 U	91	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.71	3.3	5 U	460	350	5 U	0.5 U
	08/28/2003	ORIG	22	3.6	1 U	1 U	1 U	39	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	9.3	340	120	5 U	0.5 U
	02/25/2004	ORIG	17	2.5	1 U	1 U	1 U	16	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	0 83 J	5 U	62	46	5 U	0.5 U
	02/25/2004	N	1.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	0.53 J	5 U	1 U	5 U	0.5 U
	08/25/2004	ORIG	18	0.87 J	1 U	1 U	1 U	3.8	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	0.47 J	1.9 J	16	9.4	5 U	0 5 U
OW7	70.9 - 90.9																					
	03/27/2002	ORIG	5.6	1.2	1 U	1 U	1 U	0.61 J	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	62	36	5 U	0.5 U
	03/27/2002	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	0.23 J	5 U	1 U	5 U	0.5 U
	08/21/2002	ORIG	8.2	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	51	44	5 U	0.5 U
	02/21/2003	ORIG	12	1.8	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	44	36	5 U	0.5 U
	08/26/2003	ORIG	7.9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	63	54	5 U	0.5 U
	02/25/2004	ORIG	20	1.4	1 U	1 U	1 U	0.94 J	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	52	34	5 U	0.5 U
	08/25/2004	ORIG	7.4	1.3	1 U	1 U	1 U	0.4 J	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	32	29	5 U	0.5 U
OW8	60.4 - 80																					
	03/27/2002	ORIG	11000	930	50	33	2.2	1600	6.3	92	48	110	1.7	1 U	1.2	0.5 U	390	36	2500	820	1.9 J	0.5 U
	08/22/2002	ORIG	9400	910	49	20 U	20 U	1700	20 U	81	46	49	20 U	20 U	20 U	10 U	350	100 U	2100	1000	100 U	10 U
	08/22/2002	DUP	10000	840	47	25	1.9	1500	9.7	66	45	86	1.2	1 U	1.1	0.5 U	340	140	5 U	910	5 U	0.5 U

Table 3-3
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval	Sample Date	Sample Type	PCE (5)	TCE (5)	1,1,1-TCA (200)	1,1,2-TCA (5)	PCA	1,1-DCE (6)	cis-1,2-DCE (6)	trans-1,2-DCE (10)	1,1-DCA (5)	1,2-DCA (0.5)	1,2-DCB (600)	1,4-DCB (5)	CBN (70)	CTC (0.5)	CFM (80)	MC (5)	Freon 113 (1200)	Freon 11 (150)	Freon 12 (1000#)	VC (0.5)
	02/20/2003	ORIG	11000	910	50	39	20 U	1200	20 U	58	46	240	20 U	20 U	20 U	10 U	550	930	2300	1000	100 U	10 U
	02/20/2003	DUP	13000	1000	48	58	25 U	1300	25 U	73	60	310	25 U	25 U	25 U	12 U	790	2400	2500	990	120 U	12 U
	03/11/2003	ORIG	34000	2200	390	100 U	100 U	2600	100 U	110	100	820	100 U	100 U	100 U	50 U	2000	6500	2800	810	500 U	50 U
	03/11/2003	DUP	36000	2100	380	100 U	100 U	2500	100 U	100 U	100 U	790	100 U	100 U	100 U	50 U	2000	6300	2600	820	500 U	50 U
	08/27/2003	ORIG	12000	880	40	25 U	25 U	1500	25 U	46	39	140	25 U	25 U	25 U	12 U	420	120 U	1600	580	120 U	12 U
	08/27/2003	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	08/27/2003	DUP	14000	990	42	40 U	40 U	1700	40 U	43	42	150	40 U	40 U	40 U	20 U	480	200 U	1500	560	200 U	20 U
	11/20/2003	ORIG	35000	1600	290	41	1.7	1900	15	60	67	470	8.9	1 U	3	0.5 U	1300	2500	1700	540	5 U	0.5 U
	02/24/2004	ORIG	17000	1000	35 J	52	50 U	1400	50 U	68	56	350	50 U	50 U	50 U	25 U	670	1700	2200	730	250 U	25 U
	08/24/2004	ORIG	3400	1600	51 J	130	100 U	1300	100 U	100	110	780	100 U	100 U	100 U	50 U	1700	6300	2200	800	500 U	50 U
	08/24/2004	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	15	5 U	1 U	5 U	0.5 U
OW8B 116 - 126																						
	08/24/2004	ORIG	2.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
QC -																						
	08/21/2002	M	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	02/19/2003	M	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	02/20/2003	M	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U
	02/21/2003	M	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	5 U	5 U	1 U	5 U	0.5 U

Notes:

Concentrations are reported in micrograms per liter (ug/l).
Only chlorinated compounds detected above laboratory reporting limits in one or more groundwater samples are listed.
Samples analyzed by EPA Methods 502.2, 8240 or 8260.
If blank, analyte was either not reported or not analyzed.

Screened interval is shown in feet below ground surface.

U = Not detected at a concentration greater than the reporting limit shown.
J = Estimated concentration below reporting limit.
H = Estimated result; sample analyzed after holding time.
R = Result not usable based on data validation.
B = Analyte also detected in laboratory method blank.

California Maximum Contaminant Levels (MCLs) are shown in parenthesis
= California Action Level

PCE = Tetrachloroethene; TCE = Trichloroethene; TCA = Trichloroethane; PCA = 1,1,1,2-Tetrachloroethane; DCE = Dichloroethene; DCA = Dichloroethane; DCB = Dichlorobenzene; CBN = Chlorobenzene; CTC = Carbon tetrachloride; CFM = Chloroform; MC = Methylene chloride; Freon 113 = 1,1,2-Trichloro-1,2,2-trifluoroethane; Freon 11 = Trichlorofluoromethane; Freon 12 = Dichlorodifluoromethane; and VC = Vinyl chloride.

Sample Type:
ORIG = Original sample
DUP = Duplicate sample
M = Trip Blank
N = Equipment decontamination blank

Table 3-4
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval	Sample Date	Sample Type	Benzene (1)	Toluene (150)	Ethyl benzene (300)	m,p-Xylenes (1750)	o-Xylene (1750)	sec-Butyl benzene (260#)	Isopropyl benzene (770#)	1,2,4-Trimetyl benzene (330#)	1,3,5-Trimethyl benzene (330#)	Acetone	2-Propanol	MTBE (13)	Naphthalene (17#)
OW1	62.5 - 77.5														
	06/06/1996	ORIG	500 U	500 U	500 U	2000 U	2000 U					10000 U			
	07/02/1999	ORIG	10	14	1.5	1.5	3	0.5 U	1 U	1 U	1 U	10 U			1 U
	05/16/2001	ORIG	15	23	20 U	20 U	20 U	20 U	20 U	20 U	20 U	200 U		20 U	20 U
	05/16/2001	N	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/17/2001	ORIG	50 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U		100 U	100 U
	11/15/2001	ORIG	7.5	2.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/14/2002	ORIG	50 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1000 U		100 U	100 U
	08/20/2002	ORIG	100 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	2000 U		200 U	200 U
	08/20/2002	N	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/19/2003	ORIG	15	24	8.1	1	3.4	1 U	2.3	1 U	1 U	10 U		1 U	1 U
	08/26/2003	ORIG	12	8.7	3.6	1 U	1 U	1 U	1	1 U	1 U	10 U		1 U	1 U
	02/24/2004	ORIG	8.8	11	4.4	0.71 J	1.1	0.26 J	2.3	1 U	1 U	10 U		0.33 J	1 U
	08/27/2004	ORIG	200 U	400 U	400 U	400 U	400 U	400 U	400 U	400 U	400 U	4000 U		400 U	400 U
	08/27/2004	DUP	7	9.6	3.1	1 U	0.55 J	1 U	1.5	1 U	1 U	8.7 J		1 U	1 U
OW1b	110 - 120														
	07/02/1999	ORIG	0.5 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	10 U			1 U
	07/02/1999	N	0.5 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	10 U			1 U
	07/02/1999	DUP	0.5 U	0.5 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	10 U			1 U
	05/16/2001	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	16		1 U	1 U
	05/16/2001	DUP	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/17/2001	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	11/16/2001	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/14/2002	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/20/2002	ORIG	0.55	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/19/2003	ORIG	0.62	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/26/2003	ORIG	1.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/24/2004	ORIG	0.57	1.1	1 U	1.3	0.71 J	1 U	1 U	0.8 J	1 U	5 J		1 U	1 U
	08/27/2004	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	6.1 J		1 U	1 U

Table 3-4
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval	Sample Date	Sample Type	Benzene (1)	Toluene (150)	Ethyl benzene (300)	m,p-Xylenes (1750)	o-Xylene (1750)	sec-Butyl benzene (260#)	Isopropyl benzene (770#)	1,2,4-Trimetyl benzene (330#)	1,3,5-Trimethyl benzene (330#)	Acetone	2-Propanol	MTBE (13)	Naphthalene (17#)
OW2	60 - 80														
	07/02/1999	ORIG	2 U	2 U	4 U	4 U	4 U	2 U	4 U	4 U	4 U	40 U			4 U
	05/15/2001	ORIG	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	100 U		10 U	10 U
	08/17/2001	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	11/16/2001	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/15/2002	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/21/2002	ORIG	2 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	40 U		4 U	4 U
	02/19/2003	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	03/10/2003	ORIG	1 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	20 U		2 U	2 U
	08/27/2003	ORIG	2.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	50 U		5 U	5 U
	02/24/2004	ORIG	2.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	50 U		5 U	5 U
	08/24/2004	ORIG	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	100 U		10 U	10 U
OW3	63 - 83														
	07/02/1999	ORIG	2 U	2 U	4 U	4 U	4 U	2 U	4 U	4 U	4 U	40 U			4 U
	05/16/2001	ORIG	10 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	200 U		20 U	20 U
	08/17/2001	ORIG	2 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	40 U		4 U	4 U
	11/15/2001	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/15/2002	ORIG	2 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	40 U		4 U	4 U
	08/20/2002	ORIG	2 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	40 U		4 U	4 U
	02/20/2003	ORIG	2 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	40 U		4 U	4 U
	02/20/2003	N	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	03/13/2003	ORIG	2 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	40 U		4 U	4 U
	08/26/2003	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/25/2004	ORIG	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	100 U		10 U	10 U
	02/25/2004	DUP	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	100 U		10 U	10 U
	08/24/2004	ORIG	2.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	50 U		5 U	5 U
OW4A	49.8 - 69.8														
	05/16/2001	ORIG	10 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	200 U		20 U	20 U
	08/16/2001	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U

Table 3-4
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval	Sample Date	Sample Type	Benzene (1)	Toluene (150)	Ethyl benzene (300)	m,p-Xylenes (1750)	o-Xylene (1750)	sec-Butyl benzene (260#)	Isopropyl benzene (770#)	1,2,4-Trimetyl benzene (330#)	1,3,5-Trimethyl benzene (330#)	Acetone	2-Propanol	MTBE (13)	Naphthalene (17#)
	11/16/2001	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	11/16/2001	N	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/15/2002	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/15/2002	N	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/21/2002	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/20/2003	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	03/14/2003	ORIG	0.5 U	1.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/27/2003	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/27/2004	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/25/2004	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	12		0.5 J	0.52 J
	08/25/2004	DUP	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	9 J		0.39 J	1 U
OW4B	112 - 122.3														
	04/03/2001	ORIG	0.5 U	1 U	1 U	1.1	1 U	1 U	1 U	1 U	1 U	28	350		1 U
	05/16/2001	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	120	940	1 U	1 U
	08/16/2001	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	470		1 U	1 U
	11/16/2001	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1500		1 U	1 U
	02/15/2002	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	280	650	1 U	1 U
	08/21/2002	ORIG	1.8	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	240	570	1 U	1 U
	02/20/2003	ORIG	0.79	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	220		1 U	1 U
	08/27/2003	ORIG	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	46		1 U	1 U
	02/27/2004	ORIG	0.5 U	0.36 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	8.4 J		1 U	1 U
	08/25/2004	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.2 J		1 U	1 U
OW5	30 - 50														
	08/17/2001	ORIG	1 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	20 U		2 U	2 U
	08/17/2001	N	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/17/2001	DUP	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	11/16/2001	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	11/16/2001	DUP	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/15/2002	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U

Table 3-4
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval	Sample Date	Sample Type	Benzene (1)	Toluene (150)	Ethyl benzene (300)	m,p-Xylenes (1750)	o-Xylene (1750)	sec-Butyl benzene (260#)	Isopropyl benzene (770#)	1,2,4-Trimetyl benzene (330#)	1,3,5-Trimethyl benzene (330#)	Acetone	2-Propanol	MTBE (13)	Naphthalene (17#)
	02/15/2002	DUP	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/22/2002	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/21/2003	ORIG	0.53	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/28/2003	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/24/2004	ORIG	0.89	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/25/2004	ORIG	0.81	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	14		0.51 J	1 U
OW6	38 - 58														
	05/16/2001	ORIG	2.8	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	40 U		270	4 U
	08/17/2001	ORIG	2.5	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	40 U		150	4 U
	11/16/2001	ORIG	1.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		120	1 U
	02/15/2002	ORIG	2.4	1 U	1 U	1 U	1 U	1.4	1 U	1 U	1 U	10 U		92	1 U
	08/21/2002	ORIG	0.86	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		150	1 U
	02/21/2003	ORIG	1.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		34	1 U
	08/28/2003	ORIG	0.57	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		90	1 U
	02/25/2004	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1.4	1 U
	02/25/2004	N	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1.3
	08/25/2004	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.1 J		0.43 J	1 U
OW7	70.9 - 90.9														
	03/27/2002	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	03/27/2002	N	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/21/2002	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/21/2003	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/26/2003	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/25/2004	ORIG	0.5 U	0.39 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	6.6 J		1 U	1 U
	08/25/2004	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
OW8	60.4 - 80														
	03/27/2002	ORIG	5.4	1.9	1 U	1 U	0.62 J	1 U	1 U	1 U	1 U	41		1 U	1 U
	08/22/2002	ORIG	10 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	200 U		20 U	20 U
	08/22/2002	DUP	5.3	4.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	89		1 U	1 U

Table 3-4
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval	Sample Date	Sample Type	Benzene (1)	Toluene (150)	Ethyl benzene (300)	m,p-Xylenes (1750)	o-Xylene (1750)	sec-Butyl benzene (260#)	Isopropyl benzene (770#)	1,2,4-Trimetyl benzene (330#)	1,3,5-Trimethyl benzene (330#)	Acetone	2-Propanol	MTBE (13)	Naphthalene (17#)
	02/20/2003	ORIG	10 U	44	20 U	20 U	20 U	20 U	20 U	20 U	20 U	1600		20 U	20 U
	02/20/2003	DUP	12 U	120	25 U	25 U	25 U	25 U	25 U	25 U	25 U	5800		25 U	25 U
	03/11/2003	ORIG	50 U	900	100 U	100 U	100 U	100 U	100 U	100 U	100 U	6300		100 U	100 U
	03/11/2003	DUP	50 U	860	100 U	100 U	100 U	100 U	100 U	100 U	100 U	5800		100 U	100 U
	08/27/2003	ORIG	12 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	250 U		25 U	25 U
	08/27/2003	N	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	08/27/2003	DUP	20 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	400 U		40 U	40 U
	11/20/2003	ORIG	7.2	410	13	44	26	1 U	1.2	11	2.4	2500		1 U	1 U
	02/24/2004	ORIG	25 U	92	50 U	50 U	50 U	50 U	50 U	50 U	50 U	2000		50 U	50 U
	08/24/2004	ORIG	50 U	340	100 U	100 U	27 J	100 U	100 U	100 U	100 U	7400		100 U	100 U
	08/24/2004	N	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	7.2 J		1 U	1 U
OW8B	116 - 126														
	08/24/2004	ORIG	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.7 J		1 U	1 U
QC	-														
	08/21/2002	M	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/19/2003	M	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/20/2003	M	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U
	02/21/2003	M	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U		1 U	1 U

Notes:

Concentrations are reported in micrograms per liter (ug/l).

Screened interval is shown in feet below ground surface.

Only analytes detected above laboratory reporting limits in one or more groundwater samples are listed.
U = Not detected at a concentration greater than the reporting limit shown.
H = Estimated result; sample analyzed after holding time.
J = Estimated concentration between the laboratory method detection and reporting limits.
Samples analyzed by EPA Methods 502.2, 8240 or 8260.
If blank, analyte was either not reported or not analyzed.

MTBE = Methyl tertiary butyl ether

Sample Type:
DUP = Duplicate sample
ORIG = Original sample
M = Trip Blank
N = Equipment decontamination blank

California Maximum Contaminant Levels (MCLs) are shown in parenthesis
= California Action Level

Table 3-5
Omega Chemical Superfund Site
Pesticide and Semi-Volatile Organic Compound (SVOC) Analytical Summary
Groundwater Analytical Results

		OW-1				OW-1b			
Method	**Analyte**	**5/16/01**	**8/17/01**	**11/15/01**	**2/14/02**	**5/16/01**	**8/17/01**	**11/16/01**	**2/14/02**
EPA 8081A	4,4'-DDD	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	4,4'-DDE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	4,4'-DDT	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	ALDRIN (HHDN)	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	ALPHA-BHC (A-BHC)	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	BETA-BHC (B-BHC)	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	CHLORDANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
	DELTA-BHC (C-BHC)	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	
	DIELDRIN	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	ENDOSULFAN I	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	ENDOSULFAN II	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	ENDOSULFAN SULFATE	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	
	ENDRIN	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	ENDRIN ALDEHYDE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	ENDRINE KETONE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	GAMMA-BHC (LINDANE)	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	HEPTACHLOR	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	HEPTACHLOR EPOXIDE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	METHOXYCHLOR	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
	TOXAPHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
EPA 8270C	1,2,4-TRICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	1,2-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	1,3-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	1,4-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	2,4,5- TRICHLOROPHENOL	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
	2,4,6-TRICHLOROPHENOL	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
	2,4-DICHLOROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	2,4-DIMETHYLPHENOL	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
	2,4-DINITROPHENOL	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
	2,4-DINITROTOLUENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	2,6-DINITROTOLUENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	2-CHLORONAPHTHALENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	2-CHLOROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	2-METHYLNAPHTHALENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	2-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	2-NITROANILINE	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
	2-NITROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	3,3-DICHLOROBENZIDINE	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
	3-NITROANILINE	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
	4,6-DINITRO-2-METHYLPHENOL	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U

Table 3-5
Omega Chemical Superfund Site
Pesticide and Semi-Volatile Organic Compound (SVOC) Analytical Summary
Groundwater Analytical Results

Method	Analyte	OW-1 5/16/01	OW-1 8/17/01	OW-1 11/15/01	OW-1 2/14/02	OW-1b 5/16/01	OW-1b 8/17/01	OW-1b 11/16/01	OW-1b 2/14/02
EPA 8270C	4-BROMOPHENYL-PHENYL ETHER	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	4-CHLORO-3-METHYLPHENOL	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
	4-CHLOROANILINE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	4-CHLOROPHENYL-PHENYL ETHER	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	4-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	4-NITROANILINE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
	4-NITROPHENOL	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
	ACENAPHTHENE (ETHYLENE NAPH	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	ACENAPHTHYLENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	ANILINE (PHENYLAMINE) (AMINOBE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	AZOBENZENE	20 U	20 U	20 U		20 U	20 U	20 U	
	BENZIDINE	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
	BENZO(A)ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	BENZO(A)PYRENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	BENZO(B)FLUORANTHENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	BENZO(G,H,I)PERYLENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	BENZO(K)FLUORANTHENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	BENZOIC ACID	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
	BENZYL ALCOHOL (PHENYLMETHA	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
	BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	BIS(2-CHLOROETHYL)ETHER	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	BIS(2-CHLOROISOPROPYL)ETHER	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	BIS(2-ETHYLHEXYL)PHTHALATE	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
	BUTYLBENZYL PHTHALATE	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
	CHRYSENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	DI-N-BUTYLPHTHALATE	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
	DI-N-OCTYL PHTHALATE (DIOCTYL	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
	DIBENZO(A,H)ANTHRACENE	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
	DIBENZOFURAN (DIPHENYLENE OXI	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	DIETHYL PHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	DIMETHYL PHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	FLUORANTHENE (IDRYL)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	FLUORENE (ALPHA-DIPHENYLENEM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	HEXACHLOROBENZENE (PERCHLO	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	HEXACHLOROBUTADIENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	HEXACHLOROCYCLOPENTADIENE	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
	HEXACHLOROETHANE (PERCHLOR	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	INDENO(1,2,3-C,D)PYRENE	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
	ISOPHORONE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Table 3-5
Omega Chemical Superfund Site
Pesticide and Semi-Volatile Organic Compound (SVOC) Analytical Summary
Groundwater Analytical Results

Method	Analyte	OW-1 5/16/01	OW-1 8/17/01	OW-1 11/15/01	OW-1 2/14/02	OW-1b 5/16/01	OW-1b 8/17/01	OW-1b 11/16/01	OW-1b 2/14/02
EPA 8270C	N-NITROSODI-N-PROPYLAMINE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	N-NITROSODIPHENYLAMINE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	NAPHTHALENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	NITROBENZENE (OIL OF MIRBANE)	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
	PENTACHLOROPHENOL (PCP)	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
	PHENANTHRENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	PHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	PYRENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes

All concentrations are reported in micrograms per liter (ug/l)
U = Not detected at a concentration greater than the reporting limit shown

Table 3-6
Omega Chemical Superfund Site
Metals Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval	Sample Date	Sample Type	Total/ Dissolved	Ag	As	Ba	Be	Cd	Co	Cr	Cu	Hg	Mo	Ni	Pb	Sb	Se	Tl	V	Zn
OW1	62.5 - 77.5																			
	05/16/2001	ORIG	Total	2 U	7.4	81	1 U	2 U	5.1	8.1	4.2	0.2 U	22	45	2 U	4 U	24	2 U	14	40 U
			Diss	1 U	6.7	55	0.5 U	1 U	3.1	1 U	2 U	0.2 U	22	30	1 U	2 U	24	1 U	1.8	20 U
	08/17/2001	ORIG	Total	1 U	6.6	79	0.5 U	1.6	4.3	8.9	5.3	0.2 U	22	32	1.2	2 U	25	1 U	13	20 U
			Diss	1 U	4	51	0.5 U	1.1	2.7	1 U	2 U	0.2 U	22	23	1 U	2 U	21	1 U	4.2	20 U
	11/15/2001	ORIG	Total	2 U	2.7	55	1 U	2 U	3.4	2 U	4 U	0.2 U	23	21	2 U	4 U	19	2 U	7.7	40 U
			Diss	2 U	2.7	50	1 U	2 U	3	2 U	4 U	0.2 U	21	22	2 U	4 U	21	2 U	5.6	40 U
	02/14/2002	ORIG	Total	1 U	3.4	51	0.5 U	1 U	2.5	1.4	2	0.2 U	21	22	1 U	2 U	21	1 U	4.9	20 U
			Diss	1 U	3.2	52	0.5 U	1 U	2.4	1 U	9.3	0.2 U	21	23	1 U	2 U	20	1 U	4.7	20 U
OW1b	110 - 120																			
	05/16/2001	ORIG	Total	1 U	2.3	20	0.5 U	1 U	1	1.8	5.9	0.2 U	49	6.8	1 U	2 U	2.6	1 U	2.7	120
			Diss	1 U	1.7	12	0.5 U	1 U	1 U	1 U	2 U	0.2 U	46	1.7	1 U	2 U	3.1	1 U	1.1	20 U
	05/16/2001	DUP	Total	1 U	2.6	22	0.5 U	1 U	1.3	2.3	7.4	0.2 U	47	8.5	2.9	2 U	2.9	1 U	2.8	130
			Diss	1 U	1.9	11	0.5 U	1 U	1 U	1 U	2 U	0.2 U	45	1.7	1 U	2 U	3.3	1 U	1.2	20 U
	08/17/2001	ORIG	Total	1 U	2.2	31	0.5 U	1 U	1.1	1.7	5	0.2 U	55	6.3	1 U	2 U	5.8	1 U	2.4	86
			Diss	1 U	1 U	22	0.5 U	1 U	1 U	1 U	2 U	0.2 U	59	2.8	1 U	2 U	4.8	1 U	1 U	20 U
	11/16/2001	ORIG	Total	2 U	2 U	30	1 U	2 U	2 U	2 U	4 U	0.2 U	68	3.9	2 U	4 U	6.2	2 U	2.9	54
			Diss	2 U	2 U	24	1 U	2 U	2 U	2 U	4 U	0.2 U	68	8.1	2 U	4 U	6.5	2 U	2 U	40 U
	02/14/2002	ORIG	Total	1 U	2.7	53	0.5 U	1 U	2.4	4.1	11	0.2	64	14	1.4	2 U	5.9	1 U	6.8	260
			Diss	1 U	1 U	22	0.5 U	1 U	1 U	1 U	2 U	0.2 U	68	4	1 U	2 U	5.9	1 U	1 U	20 U

Notes:

Concentrations are reported in micrograms per liter (ug/l).

Screened interval is shown in feet below ground surface.

U = Not detected at a concentration greater than the reporting limit shown.

All metals (except mercury) analyzed by EPA Method 6020; Mercury analyzed by EPA Method 7470.

Sample Type:
ORIG = Original sample
DUP = Duplicate sample

Ag = Silver; As = Arsenic; Ba = Barium; Be = Beryllium; Cd = Cadmium; Co = Cobalt; Cr = Chromium; Cu = Copper; Hg = Mercury; Mo = Molybdenum; Ni = Nickel; Pb = Lead; Sb = Antimony; Tl = Thallium; V = Vanadium; Zn = Zinc.

Table 3-7
Omega Chemical Superfund Site
Cyanide, Hexavalent Chromium, Perchlorate and 1,4-Dioxane Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval		Sample Date	Sample Type	Cyanide (150)	Hexavalent Chromium (50*)	Perchlorate (6#)	1,4-Dioxane (3#)
OW1	62.5 - 77.5	05/16/2001	ORIG	25 U		4 U	
		08/17/2001	ORIG	25 U		4 U	
		11/15/2001	ORIG			4 U	3300 E
		02/14/2002	ORIG	25 U		4 U	11000 E
		08/20/2002	ORIG				4100 E
		08/20/2002	N				0.63
		02/19/2003	ORIG		0.3 U	4 U	52000
		08/26/2003	ORIG				8400
		08/26/2003	DUP				2700 E
		02/24/2004	ORIG				12000
		08/27/2004	ORIG				5600
		08/27/2004	DUP				6800
OW1b	110 - 120	05/16/2001	ORIG	25 U		4 U	
		05/16/2001	DUP	25 U		4 U	
		08/17/2001	ORIG	25 U		4 U	
		11/16/2001	ORIG			4 U	57
		02/14/2002	ORIG	25 U		4 U	41
		08/20/2002	ORIG				60
		02/19/2003	ORIG		0.3 U	4 U	17
		08/26/2003	ORIG				27
		02/24/2004	ORIG				26
		08/27/2004	ORIG				14
OW2	60 - 80	11/16/2001	ORIG				0.5 U
		02/15/2002	ORIG				0.54 U
		08/21/2002	ORIG				1
		02/19/2003	ORIG		3.1	4 U	1.4
		03/10/2003	ORIG				0.5 U
		08/27/2003	ORIG				0.5 U
		02/24/2004	ORIG				0.5 U
		08/24/2004	ORIG				12
OW3	63 - 83	11/15/2001	ORIG				1
		02/15/2002	ORIG				1.1
		08/20/2002	ORIG				1.2
		02/20/2003	ORIG		5.4	4 U	0.5 U
		02/20/2003	N		0.3 U	4 U	0.5 U
		03/13/2003	ORIG				1.2
		08/26/2003	ORIG				1.6 UB
		02/25/2004	ORIG				0.51
		02/25/2004	DUP				0.5 U
		08/24/2004	ORIG				0.5 U

Table 3-7
Omega Chemical Superfund Site
Cyanide, Hexavalent Chromium, Perchlorate and 1,4-Dioxane Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval		Sample Date	Sample Type	Cyanide (150)	Hexavalent Chromium (50*)	Perchlorate (6#)	1,4-Dioxane (3#)
OW4A	49 8 - 69.8	11/16/2001	ORIG				4.9
		02/15/2002	ORIG				11
		08/21/2002	ORIG				14
		02/20/2003	ORIG		12	4 U	0.88
		03/14/2003	ORIG				1.8
		08/27/2003	ORIG				1 UB
		02/27/2004	ORIG				0.5 U
		08/25/2004	ORIG				1.8
		08/25/2004	DUP				1.9
OW4B	112 - 122.3	11/16/2001	ORIG				0.53 U
		02/15/2002	ORIG				0.51 U
		08/21/2002	ORIG				0.5 U
		02/20/2003	ORIG		0.3 U	9.4	0.5 U
		08/27/2003	ORIG				0.6 UB
		02/27/2004	ORIG				0.5 U
		08/25/2004	ORIG				0.5 U
OW5	30 - 50	11/16/2001	ORIG				0.76
		11/16/2001	DUP				0.88
		02/15/2002	ORIG				1.1
		02/15/2002	DUP				0.98
		08/28/2003	ORIG				0.58
		02/24/2004	ORIG				68
		08/25/2004	ORIG				85
OW6	38 - 58	11/16/2001	ORIG				4
		02/15/2002	ORIG				0.86
		08/28/2003	ORIG				0.85
		02/25/2004	ORIG				0.7
		02/25/2004	N				0.5 U
		08/25/2004	ORIG				0.5 U
OW7	70.9 - 90.9	03/27/2002	ORIG				0.5 U
		08/26/2003	ORIG				0.5 U
		02/25/2004	ORIG				0.5 U
		08/25/2004	ORIG				0.5 U
OW8	60.4 - 80	03/27/2002	ORIG				1000
		08/22/2002	ORIG				830
		08/22/2002	DUP				840
		02/20/2003	ORIG		1.1	4 U	240
		02/20/2003	DUP		0 86	4 U	180
		03/11/2003	ORIG				2600

Table 3-7
Omega Chemical Superfund Site
Cyanide, Hexavalent Chromium, Perchlorate and 1,4-Dioxane Analytical Summary
Groundwater Analytical Results

Well ID/ Screened Interval		Sample Date	Sample Type	Cyanide (150)	Hexavalent Chromium (50*)	Perchlorate (6#)	1,4-Dioxane (3#)
OW8	60.4 - 80	03/11/2003	DUP				2600
		08/27/2003	ORIG				98
		08/27/2003	N				0.5 UB
		08/27/2003	DUP				89
		11/20/2003	ORIG				2700
		02/24/2004	ORIG				210
		08/24/2004	ORIG				5300
		08/24/2004	N				0.5 U
OW8B	116 - 126	08/24/2004	ORIG				0.5 U

Notes:

Concentrations are reported in micrograms per liter (ug/l).

U = Not detected at a concentration greater than the reporting limit shown.
E = Estimated result. Concentration exceeds instrument's upper calibration range.
B = Analyte also detected in laboratory method blank.

Screened interval is shown in feet below ground surface.

Cyanide analyzed by EPA Method 335.2; perchlorate by EPA Method 300 modified or Method 314 (2003 results); 1,4-dioxane analyzed by EPA Method 8270 modified; and hexavalent chromium analyzed by EPA Method 218.6.

Sample Type:
DUP = Duplicate sample
ORIG = Original sample
= Equipment decontamination blank

California Maximum Contaminant Levels (MCLs) are shown in parenthesis
= California Action Level
* = Total chromium MCL

Table 3-8
Omega Chemical Superfund Site
Biodegradation and Natural Attenuation Parameters
Groundwater Analytical Results

Well ID/ Screened Interval		Sample Date	Sample Type	Methane (ug/l)	Ethane (ng/l)	Ethene (ng/l)	Nitrate (as N) (mg/l)	Nitrite (as N) (mg/l)	DOC (mg/l)
OW1	62 5 - 77.5	02/19/2003	ORIG	4.8	3200	1400	11	0.3 U	52
OW1b	110 - 120	02/19/2003	ORIG	2400	480	1500	2.7	1	1.3
OW2	60 - 80	02/19/2003	ORIG				11	0.3 U	1.5
OW3	63 - 83	02/20/2003	ORIG				8.8	0.3 U	1.1
		02/20/2003	N				0.11 U	0.15 U	1 2
OW4A	49.8 - 69.8	02/20/2003	ORIG				11	0.3 U	1.6
OW4B	112 - 122.3	02/20/2003	ORIG				0.11 U	0.15 U	4.2
OW8	60.4 - 80	02/20/2003	ORIG	4.7	36	1000	9.3	0.75 U	8.4
		02/20/2003	DUP	4.5	47	1400	9.8	0.75 U	19

Notes:

U = Not detected at a concentration greater than the reporting limit shown.
ug/l = micrograms per liter
ng/l = nanograms per liter
- ~/l = milligrams per liter

'ened interval is shown in feet below ground surface.

Methane analyzed by Method AM20GAX; ethane and ethene analyzed by Method AM18; nitrate and nitrite analyzed by EPA Method 300.0; Dissolved organic carbon (DOC) analyzed by method EPA 415.1.

Sample Type:
DUP = Duplicate sample
ORIG = Original sample
N = Equipment decontamination blank

Table 3-9
Omega Chemical Superfund Site
Biodegradation, Natural Attenuation, and Other Field Results

Well No.	Date	pH	Electrical Conductivity (umhos/cm)	Turbidity (NTUs)	Dissolved Oxygen (ppm)	Redox Potential (mV)	Alkalinity (as $CaCO_3$)	Hydrogen Sulfide	Carbon Dioxide (as $CaCO_3$)	Ferrous Iron	Sulfate	Chloride
OW1	02/19/2003	6.73	1629	12	0.44	-15.8	590	0.1272	97.5	0.215	162.5	70
OW1b	02/19/2003	7.4	1140	83	0.30	-151.0	230	0.04982	17.5	0.245	475	47.5
OW2	02/19/2003	7.0	1339	5	3.25	87.1	360	0.00954	57.5	<0.01	295	46.25
OW3	02/20/2003	6.94	1524	49	4.5	4.8	400	0.01325	55	0.105	355	26.25
OW4a	02/20/2003	7.04	1448	1	3.29	84.6	550	0.00212	77.5	<0.01	222.5	47.5
OW4b	02/20/2003	7.30	1441	1	3.08	-2.8	90	0.04081	<1.25	<0.01	165	41.25
OW8	02/20/2003	6.89	1676	3	1.57	-155.1	440	0.04876	65	0.43	347.5	72.5

Note: Electrical Conductivity, pH, Turbidity, Dissolved Oxygen, and Redox Potential by Direct Reading Instrument, units as indicated.
Alkalinity, Hydrogen Sulfide, Carbon Dioxide, Ferrous Iron, Sulfate and Chloride by Hach Test Kit, all concentrations in milligrams per liter (mg/l).

mV = millivolts
ppm = parts per million
NTU = Nephelometric Turbidity Units
umhos/cm = micromhos per centimeter
$CaCO_3$ = Calcium Carbonate

Table 3-10
Omega Chemical Superfund Site
Volatile Organic Compounds (VOCs) and 1,4-Dioxane Analytical Summary
Soil Analytical Results

Boring Number	Sample Date	Sample Depth (ft bgs)	Sample Type	PCE	TCE	1,1,1-TCA	1,1,2-TCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCA	1,2-DCA	CFM	MC	Freon 11	Acetone	Benzene	Toluene	1,4-Dioxane
GP1	10/27/03	60	ORIG	4600	130	83 U	83 U	210 U	83 U	83 U	83 U	83 U	83 U	830 U	210 U	1200 U	83 U	83 U	25 U
	10/27/03	75	ORIG	4100	100	84 U	84 U	210 U	84 U	84 U	84 U	84 U	84 U	840 U	210 U	1300 U	84 U	84 U	25 U
	10/27/03	85	ORIG	100	4.5	1.6 U	1.6 U	4 U	1.6 U	1.6 U	1.6 U	1.6 U	1 6 U	16 U	4 U	8 U	1.6 U	1.6 U	25 U
GP2	10/28/03	65	ORIG	4200	180	82 U	82 U	200 U	82 U	82 U	82 U	82 U	82 U	820 U	200 U	1200 U	82 U	82 U	25 U
	10/28/03	65	DUP	4000	170	80 U	80 U	200 U	80 U	80 U	80 U	80 U	80 U	800 U	200 U	1200 U	80 U	80 U	25 U
	10/28/03	77	ORIG	1500	82 U	82 U	82 U	200 U	82 U	82 U	82 U	82 U	82 U	820 U	200 U	1200 U	82 U	82 U	25 U
	10/28/03	79	ORIG	1700	100 U	100 U	100 U	250 U	100 U	100 U	100 U	100 U	100 U	1000 U	250 U	1500 U	100 U	100 U	25 U
GP3A	10/28/03	10	ORIG	3200	85 U	85 U	85 U	210 U	85 U	85 U	85 U	85 U	85 U	850 U	210 U	1300 U	85 U	85 U	10000
	10/28/03	20	ORIG	300	9	16	4.3	4.2 U	1.7 U	1.7 U	3.6	40	2.8	17 U	4.2 U	8.3 U	1 7 U	1.7 U	1300
	10/28/03	32	ORIG	130	6.9	5.8	7.2	5 U	2 U	2 U	3 4	120	3 8	20 U	5 U	12	2 U	2 U	300
	10/28/03	45	ORIG	3800	140	78 U	78 U	200 U	78 U	78 U	78 U	220	78 U	780 U	200 U	1200 U	78 U	78 U	25 U
	10/28/03	55	ORIG	5600	130	81 U	81 U	200 U	81 U	81 U	81 U	110	81 U	810 U	200 U	1200 U	81 U	81 U	25 U
	10/28/03	65	ORIG	12000	190	130	100 U	250 U	100 U	100 U	100 U	140	100 U	1000 U	250 U	1500 U	100 U	100 U	25 U
	10/28/03	78	ORIG	13	2 U	2 U	2 U	5 U	2 U	2 U	2 U	2 1	2 U	20 U	5 U	10 U	2 U	2 U	25 U
	10/28/03	85	ORIG	970	83 U	83 U	83 U	210 U	83 U	83 U	83 U	83 U	83 U	830 U	210 U	1200 U	83 U	83 U	25 U
GP4	01/20/04	20	ORIG	100	7.1	2.6	1.8 U	4.5 U	1.8 U	1.8 U	1.8 U	3.2	5 7	18 U	4.5 U	9 U	1 8 U	1 8 U	170
	01/20/04	35	ORIG	4200	30	5.1	6.7	13	1 7 U	1.7 U	7.3	14	28	17 U	4.3 U	8.6 U	3 1	1 7 U	59
	01/20/04	48	ORIG	4300	74	15	19	36	2 U	2 U	19	30	65	20 U	5 U	10 U	5 6	2 U	25 U
	01/21/04	68	ORIG	48000	430	340	140	210 U	84 U	84 U	84 U	84 U	110	840 U	210 U	1300 U	84 U	84 U	25 U
GP5	01/20/04	18	ORIG	2500	100 U	100 U	100 U	250 U	100 U	100 U	100 U	100 U	100 U	1000 U	250 U	1500 U	100 U	100 U	35
	01/20/04	32	ORIG	4300	48	2.2 U	2 2 U	15	14	2.2 U	5.2	2 2 U	62	22 U	5.6 U	11 U	2 2 U	2 2 U	140
	01/20/04	54	ORIG	6800	79	4.9	2 U	34	21	2 U	10	3 3	280	20 U	5 U	10 U	2 U	3	25 U
	01/20/04	68	ORIG	3700	67	12	1.9	45	10	2	9	23	310	18 U	4.4 U	8.8 U	1.8 U	1.8 U	
	01/20/04	73	ORIG																1500
GP6	01/22/04	25	ORIG	130	3.2	1.6 U	1.6 U	10	1.8	1.6 U	1.6 U	1.6 U	1.9	16 U	4 U	8.1 U	1.6 U	1.6 U	25 U
	01/22/04	50	ORIG	8500	34	35	1 7 U	39	2	1 7 U	5 1	3 9	15	17 U	4 2 U	8.5 U	1 7 U	1.7 U	25 U

Table 3-10
Omega Chemical Superfund Site
Volatile Organic Compounds (VOCs) and 1,4-Dioxane Analytical Summary
Soil Analytical Results

Boring Number	Sample Date	Sample Depth (ft bgs)	Sample Type	PCE	TCE	1,1,1-TCA	1,1,2-TCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCA	1,2-DCA	CFM	MC	Freon 11	Acetone	Benzene	Toluene	1,4-Dioxane
GP6	01/22/04	70	ORIG	11000	42	91	1.6 U	39	1.6 U	1.6 U	1.7	2.7	6.6	16 U	3.9 U	7.9 U	1.6 U	1.6 U	25 U
GP7	01/21/04	45	ORIG	230	16	1.7 U	1.7 U	10	1.7 U	1.7 U	3.1	2.2	32	17 U	4.2 U	8.5 U	1.7 U	1.7 U	25 U
	01/21/04	60	ORIG	6200	110	6.6	4.2	85	2.4	4.9	15	2	190	59	5 U	10 U	2.1	2 U	25 U
	01/21/04	65	ORIG	11000	130	10	7.9	110	2.1	7.1	17	5	210	16 U	5.7	8 U	2.3	1.6 U	25 U
GP8	01/21/04	50	ORIG	7000	29	1.8 U	1.8 U	14	1.8 U	1.8 U	1.8 U	1.9	30	19	4.4 U	8.9 U	1.8 U	1.8 U	25 U
	01/21/04	60	ORIG	51	4.4	1.6 U	1.6 U	4.1 U	1.6 U	1.6 U	1.6 U	1.6 U	13	16 U	4.1 U	8.2 U	1.6 U	1.6 U	25 U
	01/21/04	66	ORIG	56	2 U	2 U	2 U	5 U	2 U	2 U	2 U	2 U	2.9	20 U	5 U	10 U	2 U	2 U	25 U

Notes:

Concentrations are reported in micrograms per kilogram (ug/kg).
Only compounds detected in one or more soil samples are shown.
VOCs analyzed by EPA Method 8260.
1,4-Dioxane analyzed using EPA Method 8270C (modified).

U = Not detected at a concentration greater than the reporting limit shown.

Sample Type:
ORIG = Original sample
DUP = Duplicate sample

PCE = Tetrachloroethene; TCE = Trichloroethene; TCA = Trichloroethane; DCE = Dichloroethene; DCA = Dichloroethane; CFM = Chloroform; MC = Methylene chloride; Freon 11 = Trichlorofluoromethane

Table 3-11 Summary of Aquifer Test Results

Tested Well	Test Date	Test Type	Observation Well	Discharge Rate (gpm)	Duration (Hours)	Analysis Method	Transmissivity (ft^2/day)	Comments
OW2	March, 2003	Single borehole recovery	NA	2.3	4	Cooper-Jacob Recovery	170	
OW3	March, 2003	Single borehole recovery	NA	1.34	4		NA	
OW4a	March, 2003	Single borehole recovery	NA	10.3	4	Cooper-Jacob Recovery	2691	Likely impacted by delayed yield
OW8	March, 2003	Single borehole recovery	NA	10.4	4	Cooper-Jacob Recovery	1616	Likely impacted by delayed yield
OW8	November, 2003	Multi-well test	NA	10.96	19.7	Cooper-Jacob Recovery	614	
	November, 2003	Multi-well test	PZ-1	10.96	19.7	Neuman	563	Specific yield 0.09
	November, 2003	Multi-well test	PZ-2	10.96	19.7	Neuman	810	Specific yield 0.20

Section 4
Conclusions and Recommendations

Based on evaluation of the historical and recently-acquired lithologic, water level, analytical, and aquifer testing data, the following conclusions and recommendations are provided.

4.1 Conclusions

Conclusions regarding groundwater flow direction, groundwater sampling results, and fate and transport of compounds detected in groundwater in the Phase 1a area are presented below.

4.1.1 Groundwater Flow Direction and Gradients

Monthly and semi-annual water level monitoring performed to date indicates a consistent groundwater flow direction towards the southwest in the water table zone (upper aquifer). Hydraulic gradients upgradient of cluster well OW4 were consistently steeper than the gradients observed downgradient of the well cluster (0.01 ft/ft vs. 0.002 ft/ft and 0.003 ft/ft). In addition, water levels have generally been declining throughout most of the monitored period. The groundwater flow direction and hydraulic gradient has been relatively consistent in the upper zone over the monitoring period. Also, as water levels have dropped over time in wells OW1/ OW1b and OW4a/ OW4b, the differences in head between the monitored zones have increased at both locations. During the most recent August 2004 sampling event, the head difference between the OW1/OW1b well pair was 9.28 feet, with a head difference of 8.99 feet observed at the location of well pair OW4a/OW4b. The difference in head at location OW8/OW8b during August 2004 was 17.4 feet.

4.1.2 Groundwater Sampling Results

Chlorinated VOCs and 1,4-dioxane have been detected more frequently and at elevated concentrations in the Phase 1a area, therefore, they are the primary compounds of concern. Additional detected chemicals will also be considered compounds of concern, as necessary, with respect to their potential to impact the groundwater treatment system and disposition of the treated groundwater.

Chlorinated VOCs were detected in all Phase 1a area wells, including the upgradient background well. Therefore, it is possible that the shallow groundwater underlying the entire Phase 1 area has been impacted by chlorinated VOCs. It is also possible that the plume downgradient of the Omega Site contains contaminants derived from other currently unknown sources. Due to the industrialized nature of the area, the likelihood of contribution from these unknown sources increases with distance downgradient from the Omega Site.

Based on observations at two locations where a water table and deeper well pair are present (OW1 and OW1b, and OW4a and OW4b), chlorinated VOC concentrations were observed to decline with depth and appear to be of limited vertical extent. As previously discussed, OSVOG is currently proposing to install additional shallow and deep wells in the area downgradient of the Site. These wells will allow better definition of contaminant concentrations and flow pathways in both the upper and lower aquifer zones. Concentrations were also observed to decline with increased distance downgradient from the Site. Aromatic organics, semi-VOAs, pesticides, and metals were detected sporadically and at relatively low concentrations in groundwater samples collected from the Phase 1a area wells, therefore, they are not considered compounds of concern.

Based on evaluation of the lithologic, aquifer testing, and groundwater sampling results, there appears to be a higher-permeability channel deposit immediately downgradient of the Site in the vicinity of well OW8 on Putnam Street. Relatively higher (compared to well OW2 to the north and well OW3 to the south) VOC and 1,4-dioxane concentrations were also detected in this area. Samples from the current monitoring program and early site investigations indicate that migration of CVOCs from the site occurs primarily within the noted higher permeability deposits that extend from approximately the location of temporary probe H-7 on the north to H-11, near the intersection of Washington and Putnam. Based on observed concentrations, most mass is transmitted through the center of this feature, near the location of OW-8. The extent of contamination has been sufficiently defined for purposes of remedy design for groundwater containment in the vicinity of Putnam Street. Additional design-level data will likely be needed as remedial design proceeds. The remedy may also be modified, as needed, based on the findings of the additional well installations and sampling to be performed by OSVOG.

4.1.3 Soil Sampling Results

Soil sampling results indicate the presence of a contaminant source at the location of the former UST. Soil contamination was also observed associated with contaminated groundwater and the capillary fringe.

4.1.4 Fate and Transport

Groundwater sampling results indicate that the highest contaminant concentrations are associated with the former source area locations that are upgradient of Putnam Street, and that this contamination is predominantly limited to the shallower portions of the aquifer. These contaminants include various chloroethene parent compounds (PCE and TCE) and their primary daughter product pathways (cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride [VC]); chloroethane parent compounds (PCA, 1,1,1-TCA, and 1,1,2-TCA) and their daughter products (1,1-DCA, 1,2-DCA, and 1,1-DCE [abiotic hydrolysis of 1,1,1-TCA]); choromethanes (CTC, CFM, and MC), and freons. The compound 1,4-dioxane was also found at elevated concentrations on-site at the location of boring GP3A, and is included in the below discussion.

The highest VOC concentrations are found within the shallow groundwater plume as evidenced by data from well OW1 (screened from 62.5 to 77.5 feet bgs) during the

August 2004 semi-annual sampling event. In particular, the data indicate elevated concentrations of the parent-compounds PCE (150,000 ug/l) and 1,1,1-TCA (12,000 ug/l), with TCE (3,500 ug/l) and 1,1-DCE (2,000 ug/l) present at substantially lower concentrations and likely as biotransformation daughter-products, respectively. The concentration of PCE detected at monitoring well OW1 (150,000 ug/l) represents 75 percent of the aqueous solubility of PCE (200,000 ug/l) and therefore provides strong evidence for the presence of a dense non-aqueous phase liquid (DNAPL) within this area of the Site. Conversely, groundwater data from monitoring well OW1b (screened from 110 to 120 feet bgs), which is screened in the deeper groundwater plume, during the August 2004 semi-annual sampling event indicate only minimal VOC detections at this deeper interval (PCE concentration of 87 ug/l; TCE concentration of 2.8 ug/l; and 1,1-DCE concentration of 2.2 ug/l), and aquifer characteristics that limit the vertical migration of contamination in this area.

Although the site data collected at monitoring well OW1 provide strong evidence for the presence of DNAPL, assessing the fate and transport and hence the potential mobility of DNAPL is complex, since the chemical compounds forming the DNAPL are likely to exist in other phases (e.g., air phase or water phase [in the event DNAPL reaches the water table and dissolves into the groundwater]). Evaluation of fate and transport at the site is further complicated by the likelihood that releases occurred during different, but unidentified, time periods. A release of DNAPL at the site would result in vertical migration of the DNAPL driven by soil capillarity as well as gravity. Capillary pressure is a measure of the tendency of a porous medium to suck in the wetting fluid phase, or to repel the non-wetting phase. In general, the capillary force increases in the following order: sand, silt, and clay (EPA, 1991). In unsaturated zone environments, DNAPL would generally serve as the wetting phase while air would serve as the non-wetting phase.

Correspondingly, unsaturated zone soils tend to serve as a significant "sink" for DNAPL. If the DNAPL release were relatively small, a point would be reached at which the DNAPL would no longer hold together as a continuous phase; rather, it would be separated under capillary forces as it is sucked into adjacent pore space where it would persist as isolated residual globules. In larger DNAPL releases, sufficient DNAPL may be released to reach the capillary fringe and/or water table. At the capillary fringe, water would be the wetting fluid and the DNAPL would serve as the non-wetting fluid. As such, the capillary fringe would obstruct the entry of the DNAPL into the saturated zone until sufficient volume of DNAPL has accumulated and the "DNAPL pressure head" exceeds the water capillary pressure at the capillary fringe (i.e., entry pressure). This phenomenon often results in an accumulation of DNAPL at the capillary fringe. The fraction of the hydrocarbon that is retained by the capillary forces in the porous media is referred to as residual saturation and may be quite significant in the fine-grained materials encountered at the site.

Due to the large depths at which water is encountered at the site (i.e., approximately 75 feet in the vicinity of OW1) and the predominance of fine-grained silts and clays in the subsurface, it is likely that a significant fraction of any DNAPL release at the site would be bound up in the unsaturated zone soils. Furthermore, groundwater data collected at OW1 indicate significant variability in PCE and TCE concentrations since 1996, which suggests that the VOC concentrations in groundwater are more likely to be controlled by leaching of contamination from the unsaturated zone (i.e., through DNAPL/water interactions and vapor/water interactions) rather than by dissolution from DNAPL within the saturated zone. For vadose zone environments, USEPA considers DNAPL components adsorbed onto soil as immobile, whereas the mobile components are the soluble and volatile components of the DNAPL in the water and air, respectively (EPA, 1991).

Groundwater data collected from monitoring wells located downgradient of the source areas indicate a trend towards decreasing total VOC concentrations within the shallow groundwater plume, with increasing fractions of daughter products relative to the parent compounds along a defined contaminant flow path. To facilitate the analysis of VOC trends, two subsets of contaminants (chloroethenes and chloroethanes) and their degradation daughter products were identified. Monitoring wells OW1, OW8, and OW4A are located along a general hydraulic flow path in the shallow hydrologic zone, and this group of wells was used to evaluate the contaminant transport trends. Well OW5, which is located downgradient from Washington Boulevard wells OW4a and OW4b, is also included in this evaluation. VOC concentrations within both subsets were converted to units of molar concentration by dividing each chemical concentration by its respective molecular weight. For those chemicals below the reporting limit, a value equivalent to one half of the reporting limit was applied. The results of this analysis are presented in Table F-1 and Figures F-1 and F-2 in Appendix F.

The summation of chloroethenes along the defined flow path, along with the ratio of sequential dechlorination daughter products are depicted in the table. As shown in the table, the total molar concentration of chloroethenes decreases along the flow path from 931.2 umoles/L (OW1) to 0.5 umoles/L (OW4A), with a subsequent increase to 13.4 umoles/L at OW5. These data suggest an attenuation of contaminant mass along this flow path with an increase of mass at the furthest downgradient well (OW-5).

The apparent decrease in contaminant concentrations along the defined flow path provides supporting evidence of contaminant attenuation with distance traveled from the source area, whereas the increase in contaminant mass measured at OW-5 may be attributed to commingling groundwater contaminant plumes from more than one source. Furthermore, the ratio of PCE/TCE and TCE/cis-1,2-DCE decrease along this flow path suggesting limited, active biotransformation of parent compounds to daughter products may be occurring along the defined flow path. It is important to note, however, that these conclusions are preliminary because they assume that the monitoring well network is hydraulically connected along the full length of the groundwater plume and that the network of monitoring wells provides a complete and accurate depiction of the contaminant travel path; the validity of these conclusions are weakened by the potential for tortuous flow paths and the presence of sand channels that may act as preferential contaminant flow paths.

1,4-dioxane, which is a fairly conservative contaminant (i.e., it does not sorb strongly to soils or readily biodegrade), occurs at elevated concentrations in groundwater near the Omega site; however, contaminant concentrations decrease substantially at the downgradient monitoring wells along the defined flow path. Concentrations of 1,4-dioxane at monitoring wells OW1 (6,300 ug/l) and OW8 (5,300 ug/l) support the conclusion that this contaminant is fairly conservative and its transport is accurately reflected by the these two monitoring wells. However, concentrations of this same contaminant are substantially depleted at OW4A (1.8 ug/l) and OW5 (85 ug/l), suggesting that 1,4-dioxane has not had sufficient time to transport to the downgradient regions of the groundwater plume, or that these downgradient monitoring wells may not accurately depict the contaminant flow path from upgradient monitoring wells.

While both potential scenarios are feasible, an evaluation of the Freon 11 and Freon 113 data tend to support the former conclusion that 1,4-dioxane has not had sufficient time to transport downgradient. Specifically, Freon 11 and Freon 113 are fairly conservative contaminants and therefore the observed attenuation for these contaminants along the defined flow-path (i.e., due to natural attenuation processes, or errors introduced by the monitoring well network) should be similar to that of 1,4-dioxane. Concentrations of Freon 11 and Freon 113 at monitoring well OW4A (100 and 230 ug/l, respectively) are approximately 8 to 10 times less than observed at OW8 (800 and 2,200 ug/l, respectively). In contrast, the concentration of 1,4-dioxane at OW4A (1.8 ug/l) is approximately 650 times lower than observed at OW8 (5,300 ug/l). This discrepancy in apparent attenuation provides supporting evidence that the leading edge of the 1,4-dioxane groundwater plume may be shorter in length than other contaminant at the site; however, this conclusion is complicated by the presence of tortuous flow-paths as well as other site complexities.

The attenuation of chloroethane contaminants and their daughter products with distance traveled along the defined flow path in the shallow groundwater plume are presented in Table F-1. Similar analyses for the other subsets of contaminants were not performed due to the frequency of values below the reporting limits. The transient spike in the 1,1,2-TCA/1,2-DCA ratio is the result of concentrations below the reporting limits for both chemicals.

Estimates of the advective groundwater transport and contaminant migration velocities (V_A and V_C, respectively) are presented in Table F-2. Due to unique hydrogeologic properties encountered in the shallow hydrologic zone, the defined flow path from monitoring wells OW-1 to OW-5 is segregated into three "Segments" for the purposes of this evaluation. The area between monitoring wells OW-1 and OW-8 is defined as Segment 1; the area between monitoring wells OW-8 and OW-4B is defined as Segment 2; and the area between monitoring wells OW-4B and OW-5 is defined as Segment 3. Estimates of V_A and V_C are presented separately for three "Segments" along the defined flow path, and the minimum and maximum transport times for groundwater and contaminants to travel along each individual Segment are presented in Table F-2. The minimum transport times for groundwater and contaminants to travel along the full length of the defined flow path (i.e., Segments 1 through 3) are 12.0 and 22.5 years, respectively; whereas the maximum transport times along this same flow path are 22.1 and 41.6 years, respectively. These estimates of potential transport times are generally consistent with available information on the historical operations at the site.

Despite the active dechlorination processes inferred from the above analyses, the dechlorination of the parent chloroethene and chloroethane contaminants appears to stall at intermediate biotransformation daughter products. This conclusion is supported by the relative abundance of the parent contaminants compared to their daughter products at all monitoring wells along the defined flow path. Under the proper groundwater environments, PCE may be sequentially biotransformed to TCE, cis-1,2-DCE, VC, and ethene/ethane, which are the terminal dechlorination products under reduced groundwater environments. Similarly, the TCA isomers may be sequentially biotransformed to DCA isomers, chloroethane, and ethane, while 1,1-DCE may be formed during abiotic hydrolysis of TCA. VOC data collected during August 2004 indicate that that VC and chloroethane were not detected above the reporting limits (0.5 ug/L) at any of the OW-1 through OW-8 monitoring locations. Furthermore, the intermediate chloroethene and chloroethene daughter products (cis-1,2-DCE and DCA/1,1-DCE, respectively) were generally below their respective reporting limits, or detected at concentrations that are substantially lower than their parent compounds. These findings suggest that the aquifer characteristics are not ideal for promoting the rapid and complete sequential dechlorination of the parent contaminants.

Biodedgradation/natural attenuation data collected during February 2003 indicate that significant dechlorination to innocuous end products for the chloroethene contaminants (e.g., ethene) and chloroethane contaminants (e.g., ethane) is not evident. Low concentrations of ethene at source area monitoring well OW1 (1.4 ug/l) and OW8 (1.0 ug/l) suggest limited potential for complete detoxification of the chloroethene contaminants through the reductive (anaerobic) pathways considered in this evaluation (see Tables 3-8 and 3-9 for biodegradation and natural attenuation results). Similarly, low concentrations of ethane at source area monitoring well OW1 (3.2 ug/l) and OW8 (0.036 ug/l) suggest limited detoxification of the chloroethane contaminants through reductive dechlorination processes. Limited detoxification of the chloroethene and chloroethane contaminants through reductive processes is likely due to the absence of sufficient electron donor compounds (i.e., typically measured as DOC) to drive the groundwater environment to highly reduced conditions (e.g., sulfate reducing and methanogenic) and provide the necessary source of energy to fuel contaminant dechlorination reactions. The presence of elevated DO concentrations recorded in February 2003 at OW-8 (1.57 mg/L) and OW-4A (3.29 mg/L), and elevated nitrate concentrations at OW-4A (11 mg/L), suggests the presence of oxidized groundwater reducing environments and electron acceptors that compete with the dechlorination of the chloroethene and chloroethane contaminants. Sulfate data collected in February 2003, which also competes with the contaminant dechlorination reactions, were elevated and ranged from 162.5 mg/L to 347.5 mg/L at the OW-1, OW-4A, and OW-8 monitoring wells.

The occurrence of these competing electron acceptors may be overcome through implementation of active remediation systems that can reduce the concentrations of these naturally occurring compounds and provide the necessary energy to promote the rapid and complete detoxification of the chloroethene and chloroethane contaminants. While biodegradation of some VOC daughter products (e.g., VC and chloroethane) to innocuous carbon dioxide may also occur through oxidative processes under aerobic and iron-reducing conditions that were not discussed in this section, the ability for such reactions to provide a meaningful approach to remediation would require an abundance of daughter products relative to parent compounds since the parent compounds and some intermediate compounds (e.g., PCE, TCE, cis-1,2-DCE, and DCA) generally persist under oxidized environments.

In summary, results from this screening level evaluation of intrinsic biotransformation processes suggest that active dechlorination of the primary chloroethene and chloroethane contaminants is occurring; however, complete and rapid detoxification of these contaminants is not evident from the existing data set. Furthermore, while limited detoxification of these contaminants may be occurring through reductive dechlorination processes, as evidenced by the low concentrations of ethene and ethane, the significance of these dechlorination reactions appears to be limited by absence of highly reduced groundwater environments and absence of significant electron donating compounds. While limited detoxification of these contaminants through oxidative processes is possible, the ability of oxidative processes to provide a meaningful approach to remediation is limited by the presence of higher chlorinated contaminants that do not readily biotransform under oxidized environments. Future design of remediation systems to address the chloroethene and chloroethane contaminants should consider biologically-mediated systems that are capable of achieving complete detoxification of these contaminants in-situ, thereby limiting risks associated with other technologies in which contaminant mass is transferred from one media to another.

The contaminant pathway in the shallow aquifer appears to be quite narrow, as evidenced by lithologic and water quality differences observed at the location of well OW8 compared to wells OW2 and OW3. The well pair at OW4a/4b may be located a short distance (approximately 140 to 150 feet) south of the interpreted main contaminant transport pathway. Therefore, well OW4a may be located along the edge of the plume and concentrations at that location may be lower than they would be compared to a well placed 140 to 150 feet to the north. Sampling results from the proposed OSVOG wells will be used to perform further evaluation of both the shallow and deep flow paths from the Omega Site.

4.1.5 Aquifer Characteristics

Single borehole and multi-well aquifer tests were conducted during these investigations. Estimates of transmissivity were obtained for the upper aquifer in wells along Putnam Street. The most reliable estimates were obtained from the multi-well test. The upper aquifer transmissivity in this area ranged from 563 to 810 ft^2 /day. Transmissivity increases in the downgradient direction, with a value of nearly 2,700 ft^2 /day estimated at OW4a. Sufficient data are available to allow design of a hydraulic containment system for the upper aquifer in the vicinity of Putnam Street, focusing on a sand channel deposit that appears to be transmitting the majority of the contaminant mass from the site.

4.2 Recommendations

Earlier conceptual designs for the groundwater treatment plant considered treatment for VOCs only. With the detection of relatively high concentrations of 1,4-dioxane in the on-site source area well (OW1) and elevated concentrations in the downgradient Putnam Street well (OW8), additional treatment requirements need to be considered. The compound 1,4-dioxane is not readily strippable or absorbed by granular activated carbon (GAC), therefore, alternative treatment methods (e.g., ultraviolet-oxidation [UV-OX]) need to be evaluated to address the detection of this compound.

Section 5
References

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Appendix A
Boring/Well Construction Logs and Electric Logs

399-A12\GS\06/20/96

MONITORING WELL: OW-1

PROJECT NAME: Omega

PROJECT NUMBER: 445.2

LOCATION: See Figure 1.

COMMENTS: Sampler:2.5 foot continuous core sampler & 1½-inch SPT sampler.

Weather: Hazy sunshine, wind 0-5 mph from east, 70° F.

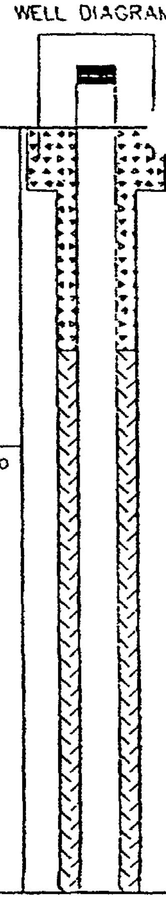
DATE DRILLED: 6/4/96	SURFACE ELEVATION: 207.9 feet msl
BOREHOLE DIA.: 6.5-inch, reamed to 10"	TOTAL DEPTH OF BORING: 80 feet bls
DRILLING COMPANY: Gregg Drilling	METHOD: Hollow Stem Auger
DRILLER'S NAME: C. Winegarner	DRILL RIG: Mobile Drill B-61
LOGGED BY: G. Cranham (R.G.# 5897)	CHECKED BY: M. Palmer (R.G.# 5915)

WELL DETAILS

DATE WELL INSTALLED: 6/4/96	COVER: Above-ground locking steel vault
	WATER LEVEL: 67.6 feet bls, (6/5/96)
SCREEN: 4-inch ID, 0.020-inch, stainless steel wire-wrap well screen.	SCREEN INTERVAL: 62.5 to 77.5 feet bls
CASING: 4-inch ID, flush threaded, schedule 40 PVC blank well casing.	CASING INTERVAL: 0 to 62.5 feet bls
DNAPL SUMP: 4-inch ID, flush threaded, stainless steel well casing	DNAPL SUMP CASING INTERVAL: 77.5 to 80 feet bls
FILTER PACK MATERIAL: No. 2/12 Monterey Sand	FILTER PACK INTERVAL: 59 to 77.5 feet bls
SEAL: Concrete 0 to 3.5 feet bls Neat Portland Cement 3.5 to 56.2 feet bls Medium Bentonite tablets 56.2 to 59 feet bls	COMMENTS Filter pack separated from cement seal surrounding DNAPL sump by canvas cementing basket.

DEPTH (feet)	SAMPLE	RECOVERY %	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION OF MATERIAL
0					Concrete Slab
0–5			ML CH		Clayey Silt to Silty Clay. Very dark brown, moist to very moist, loose.
5		72	ML		Silt with Sand, yellowish brown (10 YR 5/4), moist to very moist, soft to firm (crumbly), low plasticity, medium dry strength, low toughness, sand very fine, some carbonate pore fillings. [5-6.8': UV-no]
7.5		100			[7.5-10': UV-no]
10		84			[10-12.1': UV-no]

WELL DIAGRAM



RPT NO.

FIGURE B-3. LITHOLOGIC LOG FOR MONITORING WELL OW-1

399-A\20.. ..06\06/20/96

PROJECT NAME: Omega

PROJECT NUMBER: 445.2

DATE DRILLED: 6/4/96

MONITORING WELL: OW-1

DEPTH (feet)	SAMPLE	RECOVERY %	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION OF MATERIAL	WELL DIAGRAM
		100	ML		[12.5–15': UV–no]	
13						
14					Root casts or soil pores common at 14 to 15 feet.	
15		84			Very moist at approximately 15 feet. [15–17.1': UV–no; Dye–no reaction] Granitic pebble at 15.7 feet	
16						
17		100			[17.5–20': UV–no]	
18						
19						
20		92			[20–22.3': UV–no; Dye–no reaction]	
21						
22		36			[22.5–23.4: UV–no]	
23						
24						
25		0				
26						
27		8				
28						
29					(Clay ball in auger bit may have interfered with recovery.)	
30		88			Increased clay content at 30.1 to 30.4 feet.	
31			CH		Clay, brown (10 YR 4/3), moist, very stiff, medium to high plasticity, medium toughness, high dry strength; trace silt, trace sand, occasional pebbles	
32		72			[31.5–32.5: UV–no; Dye–no reaction] [32.5–34.3': UV–no]	

RPT NO.

FIGURE B–3. LITHOLOGIC LOG FOR MONITORING WELL OW–1

399-A\2067 7\06/20/96

MONITORING WELL: OW-1

PROJECT NAME: Omega

PROJECT NUMBER: 445.2

DATE DRILLED: 6/4/96

DEPTH (feet)	SAMPLE	RECOVERY %	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION OF MATERIAL	WELL DIAGRAM
			CH		Slickensided Structure at 33 feet.	
34						
35		40			Increased silt content at 35.1 to 35.5 feet, stiff [35–36': UV–no; Dye–no reaction]	
36						
37		52	ML		Silt with Sand, same as 5 to 14 feet. [37.5–38.8': UV–no]	
38						
39						
40		40			[40–41': UV–no; Dye–no reaction]	
41						
42						
43		92			[42.5–44.8': UV–no] 43.6 to 44 feet: grades downward to clay.	
44			CH		Clay, same as 31.2 to 37 feet.	
45		76			Increased silt content at 45 to 46 feet and 47.5 to 48 feet. [45–46.9': UV–carbonates; Dye–no reaction]	
46						
47						
48		84			[47.5–49.6': UV–carbonate]	
49					Carbonate streaks common at 49 to 52 feet.	
50		100			Slickensided structure at 50 to 51.5 feet [50–52.5': UV–carbonate; Dye–no reaction]	
51						
52						
53						

RPT NO.

SHEET 3 OF 5

FIGURE B-3. LITHOLOGIC LOG FOR MONITORING WELL OW-1

PROJECT NAME: Omega

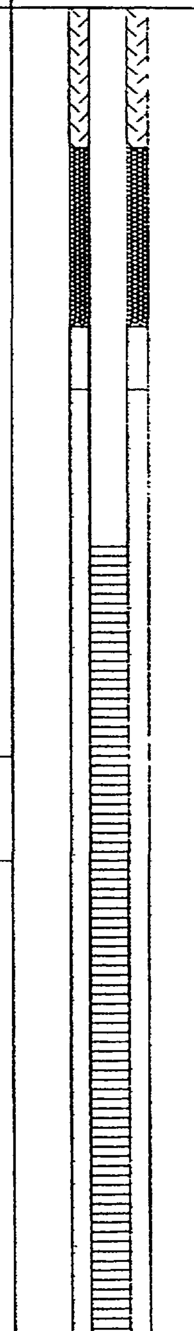
PROJECT NUMBER: 445 2

DATE DRILLED: 6/4/96

MONITORING WELL: OW-1

DEPTH (feet)	SAMPLE	RECOVERY %	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION OF MATERIAL
55			CH		
56					
57					
58					
59					
60					
61					
62					
63					
64					
65		96			Clay: dark brown. [65-67.4': UV-no; Dye-no reaction; OVA-12 ppm]
66			ML		Silt, yellowish brown with reddish-brown fine sand patches, (silt: 10 YR 5/4; fine sand: 7.5 YR 5/8), moist. Silty Sand, very moist to wet, medium to coarse, 0.05 foot thick, at base of silt, slight chemical odor.
67		100	CH		Clay, same as 31.2 to 37 feet, stiff. [67.5-70': UV-no] Wet at 67.7 feet.
68					
69					
70					
71					
72		100			[72-73.5': UV-no]
73					
74					

WELL DIAGRAM



RPT NO.

SHEET 4 OF 5

FIGURE B-3. LITHOLOGIC LOG FOR MONITORING WELL OW-1

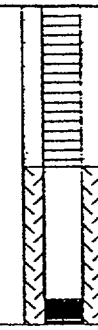
399-A\20CG9\06/20/96

MONITORING WELL: OW-1

PROJECT NAME: Omega

PROJECT NUMBER: 445 2

DATE DRILLED: 6/4/96

DEPTH (feet)	SAMPLE	RECOVERY %	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION OF MATERIAL	WELL DIAGRAM
75–80		100	CH		Carbonate steaks common at 75 to 79.5 feet. Carbonate layer at 75.5 to 75.6 feet. Increased silt content below 75 feet, firm to stiff. [75-76.5': UV-carbonate]	
		100			[78.5-80': UV-no] Granitic pebble at 78.7 feet	
81					TOTAL DEPTH OF BORING = 80 FEET BELOW LAND SURFACE	
82						
83						
84						
85						
86						
87						
88						
89						
90						
91						
92						
93						
94						
95						

RPT NO.

SHEET 5 OF 5

FIGURE B-3. LITHOLOGIC LOG FOR MONITORING WELL OW-1

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-24699-T4.FIELD	**BORING/WELL NUMBER**	OW-1b
PROJECT NAME	Omega Chemical	**DATE DRILLED**	6/16/99-6/18/99
LOCATION	12504 East Whittier Blvd, Whittier, CA	**CASING TYPE/DIAMETER**	4" Sch 40, MS Blank
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	4" SS, 20-slot
SAMPLING METHOD	Modified CA Split Spoon	**GRAVEL PACK TYPE**	Lonestar #2/12
GROUND ELEVATION		**GROUT TYPE/QUANTITY**	Portland Cement/5% Bentonite/495 gal
TOP OF CASING		**DEPTH TO WATER**	59.00
LOGGED BY	Mike Hoffman	**GROUND WATER ELEVATION**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.0						CL		CONCRETE is 4 inches thick. SILTY CLAY: brown (10YR4/3); low plasticity, soft, no UV illumination, dry to moist, no odor.	0.3	
0.0	4 6 9	18			5	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, no UV illumination, dry to moist, no odor.	5.0	
0.0		18	OC-SG-OW1b-10-061699	SG	10	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated small fragments, dry to moist, no odor.	10.0	Cement-Bentonite G (0-96 ft bgs).
9.4	5 9 14	18			15	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft; trace pebbles to 1/2" diameter; UV illuminated small fragments and streaks, dry to moist, no odor.	15.0	
0.0		18	OC-SG-OW1b-20-061699	SG	20	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft; trace pebbles to 1/2" diameter; no UV illumination, dry to moist, no odor.	20.0	
9.4	9 16 20	18			25	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, no UV illumination, dry to moist, no odor.	25.0	4", Sch 40, MS Blank (0-110 ft bgs).
9.4		18	OC-SG-OW1b-30-061699	SG	30	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, no UV illumination, dry to moist, no odor.	30.0	
					35				35.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-24699-T4.FIELD **BORING/WELL NUMBER** OW-1b

PROJECT NAME Omega Chemical **DATE DRILLED** 6/16/99-6/18/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
75.2	10 18 22	18	OC-S-OW1b-35-061699			CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, no UV illumination, dry to moist, no odor.	40.0	
18.8		18	OC-SG OW1B -40-061699	SG	40	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated small fragments, dry to moist, no odor.	45.0	
47.0	12 17 25	18	OC-S-OW1b-45-061699		45	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated small fragments, dry to moist, no odor.	50.0	Cement-Bentonite Grout (0-96 ft bgs).
3.5		18	OC-SG OW1b -50-061699	SG	50	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated small fragments, dry to moist, no odor.	55.0	
84.7	15 22 27	18	OC-S-OW1b-55-061699		55	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated small streaks, dry to moist, no odor.	60.0	
211.7		18	OC-SG OW1b -60-061699	SG	60	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated precipitate, dry to moist, moderate to strong hydrocarbon odor.	65.0	
122.3	7 18 24	18	OC-S-OW1b-65-061699		65	CL		SILTY CLAY: dark yellowish brown (10YR4/4); low plasticity, soft, UV illuminated precipitate and fragments, dry to moist, moderate to strong hydrocarbon odor.	70.0	4", Sch 40, MS Blank (0-110 ft bgs).
28.2	15 20 22	18	OC-S-OW1b-70-061699		70	CL		SILTY CLAY: brown (10YR4/3); low plasticity, stiff, UV illuminated fragments and streaks, dry to moist, no odor.	75.0	
					75					

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-24699-T4.FIELD **BORING/WELL NUMBER** OW-1b

PROJECT NAME Omega Chemical **DATE DRILLED** 6/16/99-6/18/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	DEPTH (ft. BGL)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
21.5	14 28 30	18	OC-S-OW1b-75-061699		CL	SILTY CLAY: brown (10YR4/3); low plasticity, stiff, UV illuminated fragments and streaks, dry to moist, no odor.		
21.5	12 28 31	18	OC-S-OW1b-80-061699	80	CL	SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated streaks, dry to moist, no odor.	80.0	Cement-Bentonite Grout (0-96 ft bgs).
4.7	10 11 13	18		85	CL	SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated streaks, dry to moist, no odor.	85.0	
28.2	11 14 20	18	OC-S-OW1b-90-061699	90	CL	SILTY CLAY: brown (10YR4/3); low plasticity, soft, no UV illumination, dry to moist, no odor.	90.0	4", Sch 40, M Blank (0-110 ft bgs).
0.0	3 4 4	18		95	CL	SILTY CLAY: brown (10YR4/3); low plasticity, stiff, no UV illumination, dry to moist, no odor.	95.0	Bentonite Pellets (96-99 ft bgs).
0.0	3 4 6	18	OC-S-OW1b-100-061899	100	CL	SILTY CLAY: brown (10YR4/3); low plasticity, soft to firm; traces of coarse sand to fine gravel; no UV illumination, dry to moist, no odor.	100.0	Lonestar #2/12 Filter Pack (99-130 ft bgs).
0.0	3 3 6	18		105	CL	SILTY CLAY: brown (10YR4/3); low plasticity, soft to firm; traces of coarse sand to fine gravel; no UV illumination, dry to moist, no odor.	105.0	
0.0	5 5 9	18	OC-S-OW1b-110-061899	110	CL	SILTY CLAY: brown (10YR4/3); low plasticity, firm, no UV illumination, dry to moist, no odor.	110.0	4", SS, 20-slo Screen (110-120 ft bgs).
				115			115.0	

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BORING/WELL CONSTRUCTION LOG

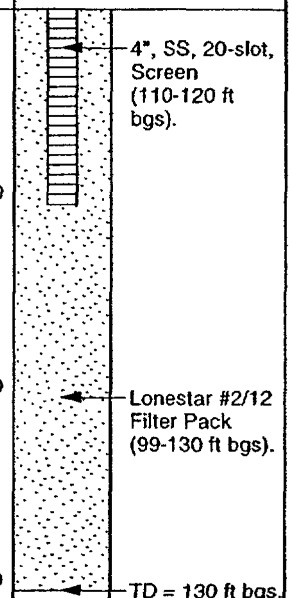
PROJECT NUMBER 10500-24699-T4.FIELD **BORING/WELL NUMBER** OW-1b

PROJECT NAME Omega Chemical **DATE DRILLED** 6/16/99-6/18/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	DEPTH (ft. BGL)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0	10 14 17	18			CL	SILTY CLAY: brown (10YR4/3); low plasticity, firm, no UV illumination, dry to moist, no odor.	120.0
0.0	4 8 12	18	OC-S-OW1b -120-061899	120	CL	SILTY CLAY: brown (10YR4/3); low plasticity, soft to firm; traces of coarse sand to fine gravel; no UV illumination, dry to moist, no odor.	125.0
0.0	8 18 24	18		125	CL	SILTY CLAY WITH GRAVEL: brown (10YR4/3); 85% silty clay, low plasticity, soft; 15% gravel in matrix, up to 1/2" diameter, angular to subrounded, low to moderate sphericity; no UV illumination, moist, no odor.	130.0
0.0	6 8 14	18		130	CL	SILTY CLAY: brown (10YR4/3); low plasticity, soft to firm; traces of coarse sand to fine gravel; no UV illumination, dry to moist, no odor.	131.5

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-24699-T4.FIELD	BORING/WELL NUMBER	OW-2
PROJECT NAME	Omega Chemical	DATE DRILLED	6/17/99
LOCATION	12504 East Whittier Blvd, Whittier, CA	CASING TYPE/DIAMETER	4" Sch 40, MS Blank
DRILLING METHOD	Hollow Stem Auger	SCREEN TYPE/SLOT	4" SS, 20-slot
SAMPLING METHOD	Modified CA Split Spoon	GRAVEL PACK TYPE	Lonestar #2/12
GROUND ELEVATION		GROUT TYPE/QUANTITY	Portland Cement/5% Bentonite/205 gal
TOP OF CASING		DEPTH TO WATER	
LOGGED BY	Mike Hoffman	GROUND WATER ELEVATION	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.0								CONCRETE is 3 inches thick.	0.3	
						CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity,stiff, soft, moist, no odor.		
0.0	5 9 10	18			5	CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	5.0	
0.0	5 5 14	18			10	CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	10.0	Cement-Bentonite Gr (0-50 ft bgs).
0.0	10 13 15	18			15	CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	15.0	
0.0	6 8 19	18			20	CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	20.0	
0.0	13 15 21	18			25	CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	25.0	4", Sch 40, MS Blank (0-60 ft bgs).
10.6	NA	18			30	CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	30.0	
					35				35.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-24699-T4 FIELD **BORING/WELL NUMBER** OW-2

PROJECT NAME Omega Chemical **DATE DRILLED** 6/17/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	DEPTH (ft BGL)	U.S C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
16 5	8 12 19	18			CL	SILTY CLAY: dark brown (10YR4/3), 100% silty clay, low plasticity; trace coarse sand to 1/4" diameter gravel, firm, moist, no odor.		Cement-Bentonite Grout (0-50 ft bgs).
16.5	15 19 22	18		40	CL	SILTY CLAY: dark brown (10YR3/3), 100% silty clay, low plasticity, soft, moist, no odor.	40.0	
49 3	16 23 29	18	OC-S-OW2 -45-061799	45	CL	SILTY CLAY: dark brown (10YR4/3), 100% silty clay, low plasticity, trace coarse sand to 1/4" diameter gravel, firm, moist, no odor.	45 0	4", Sch 40, MS Blank (0-60 ft bgs)
2 9	8 17 20	18		50	CL	SILTY CLAY: dark brown (10YR4/3); 100% silty clay, low plasticity; trace coarse sand to 1/4" diameter gravel; firm, moist, no odor.	50 0	Bentonite Pellets (50-55 ft bgs)
0.0	9 14 20	18		55	ML	SILT WITH SAND: brown (10YR4/3), 85% silt, loose, soft, slightly cohesive; 15% very fine sand; slightly moist, no odor.	55.0	Lonestar #2/12 Filter Pack (55-85 ft bgs).
27 4	7 7 20	18	OC-S-OW2 -60-061799	60	SP SM	POORLY GRADED SAND WITH SILT: brown (10YR4/3); 90% sand, very fine to fine, 10% silt in matrix,; slightly moist, no odor.	60 0	
21.9	10 14 22	18		65	SP SM	POORLY GRADED SAND WITH SILT: gray (10YR5/1); 95% sand, very fine to fine; 5% silt in matrix; very moist, slightly cohesive, no odor.	65 0	4", SS, 20-slot, Screen (60-80 ft bgs).
0 0	10 10 17	18		70	SP SM	POORLY GRADED SAND WITH SILT. gray (10YR5/1); 95% sand, very fine to fine, 5% silt in matrix; very moist, slightly cohesive, no odor.	70.0	
				75			75 0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-24699-T4 FIELD **BORING/WELL NUMBER** OW-2
PROJECT NAME Omega Chemical **DATE DRILLED** 6/17/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID	EXTENT	DEPTH (ft BGL)	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0 0	13 21 30	18				CL		SILTY CLAY dark grayish brown (10YR4/2), 100% silty clay, low plasticity, soft, moist, no odor	80 0	4", SS, 20 slot, Screen (60 80 ft bgs)
0 0	12 18 24	18	OC-S-OW2 -80-061799		80	SC		CLAYEY SAND brown (10YR4/3), 80% sand, very fine to fine 20% clay in matrix and as balls, moderate plasticity, saturated, no odor	85 0	Lonestar #2/12 Filter Pack (55 85 ft bgs)
0 0	NA	18			85	CL		SILTY CLAY dark grayish brown (10YR4/2), 100% silty clay, low plasticity, soft, moist, no odor	86 5	TD = 85 ft bgs

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-24699-T4.FIELD	**BORING/WELL NUMBER**	OW-3
PROJECT NAME	Omega Chemical	**DATE DRILLED**	6/15/99
LOCATION	12504 East Whittier Blvd, Whittier, CA	**CASING TYPE/DIAMETER**	4" Sch 40, MS Blank
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	4" SS, 20-slot
SAMPLING METHOD	Modified CA Split Spoon	**GRAVEL PACK TYPE**	Lonestar #2/12
GROUND ELEVATION		**GROUT TYPE/QUANTITY**	Portland Cement/5% Bentonite/210 gal
TOP OF CASING		**DEPTH TO WATER**	59.00
LOGGED BY	Mike Hoffman	**GROUND WATER ELEVATION**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	DEPTH (ft. BGL)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.0				0		CONCRETE is 3 inches thick.	0.3	
					CL	SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft, moist, no odor.		
0.0	3 3 4	18		5	CL	SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft, moist, no odor.	5.0	
0.0	4 6 10	18		10	CL	SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft, moist, no odor.	10.0	Cement-Bentonite Grout (0-53 ft bgs).
0.0	5 5 14	18		15	CL	SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, stiff, moist, no odor.	15.0	
0.0	5 7 13	18		20	CL	SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, stiff, moist, no odor.	20.0	
0.0	10 12 17	18		25	CL	SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft, moist, no odor.	25.0	4", Sch 40, MS Blank (0-63 ft bgs).
0.0	8 12 16	18		30	CL	SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, stiff, moist, no odor.	30.0	
				35			35.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500 24699 T4 FIELD **BORING/WELL NUMBER** OW-3

PROJECT NAME Omega Chemical **DATE DRILLED** 6/15/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID	DEPTH (ft BGL)	USCS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0 0	10 13 20	18			CL	SILTY CLAY brown (10YR4/3), 100% silty clay, low plasticity, stiff, moist, no odor	40 0	Cement-Bentonite Grout (0 53 ft bgs)
13 3	10 13 19	18	OC-S-OW3-45-061599	40	CL	SILTY CLAY brown (10YR4/3), 100% silty clay, low plasticity, stiff, moist, no odor	45 0	
0 0	12 16 22	18		45	CL	SILTY CLAY brown (10YR4/3), 100% silty clay, low plasticity, stiff, moist, no odor	50 0	4" Sch 40, MS Blank (0 63 ft bgs)
0 0	14 19 29	18	OC-S-OW3-50-061599	50	SW	WELL GRADED SAND dark yellowish brown (10YR3/4), 95% sand, very fine to very coarse, angular to rounded, low to high sphericity, 5% gravel to 1/4" diameter, angular to subrounded, low to moderate sphericity, trace silt in matrix, moist, no odor	55 0	
0 0	22 28 31	18		55	SW	NO RECOVERY assuming sand and gravel	60 0	Bentonite Pellets (53-58 ft bgs)
0 0	21 28 31	18		60	CL	SILTY CLAY brown (10YR4/3), 100% silty clay, low plasticity, soft, moist, no odor	65 0	Lonestar #2/12 Filter Pack (58 85 ft bgs)
0 0	17 25 40	18		65	CL	SILTY CLAY brown (10YR4/3), 100% silty clay, low plasticity, soft, moist, no odor	70 0	4", SS, 20-slot, Screen (63-83 ft bgs)
0 0	12 17 23	18		70	GC	CLAYEY GRAVEL brown (10YR4/3), 60% gravel, angular to subrounded, low to moderate sphericity, 35% silty clay, low plasticity, 5% well graded sand, very fine to coarse, moist, no odor	75 0	
				75				

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BORING/WELL CONSTRUCTION LOG

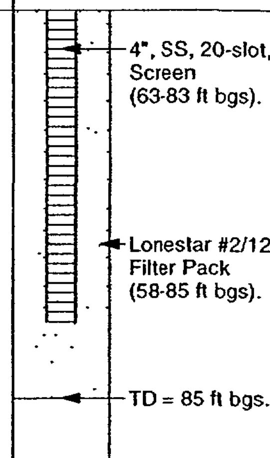
PROJECT NUMBER 10500-24699-T4.FIELD **BORING/WELL NUMBER** OW-3

PROJECT NAME Omega Chemical **DATE DRILLED** 6/15/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0	8 18 20	18	OC-S-OW3-75-061599			CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft; trace gravel; moist, no odor.	80.0
0.0	5 9 14	18			80	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft; trace gravel; moist, no odor.	85.0
0.0	10 31 21	18			85	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, stiff; trace gravel; moist, no odor.	86.5

WELL DIAGRAM



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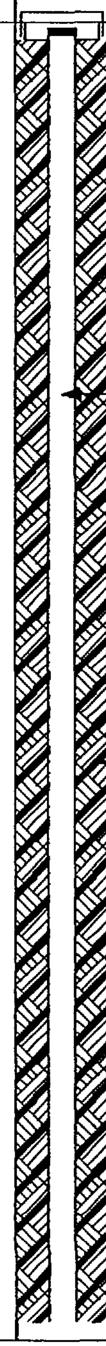
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500 30697-TO5B INSTALL	BORING/WELL NUMBER	OW-4A
PROJECT NAME	Omega Chemical	DATE DRILLED	3/15/01
LOCATION	12504 East Whittier Blvd, Whittier, CA	CASING TYPE/DIAMETER	Sch 40, Mild Steel / 4"
DRILLING METHOD	Hollow Stem Auger	SCREEN TYPE/SLOT	4" Stainless Steel Wire Wrap / 0 020"
SAMPLING METHOD	CME Continous Core	GRAVEL PACK TYPE	Lonestar #2/12
GROUND ELEVATION	182 73	GROUT TYPE/QUANTITY	Portland Cement/5% Bentonite/210 gal
TOP OF CASING	182 47	STATIC WATER LEVEL (feet btoc)	54 87
LOGGED BY	W F Grove	GROUND WATER ELEVATION	127 60

REMARKS Well is on north side of Washington Blvd , east of Lambert Rd

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	USCS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							ASPHALT is 4-inches thick.	0 3
							ROAD BASE	2 0
0 0						CL	SILTY CLAY dark brown (10YR3/3), 100% silty clay, slightly plastic, soft, moist, no odor	5 0
0 0		60			5	CL	SILTY CLAY brown (10YR4/3), 100% silty clay, slightly plastic, soft moist no odor Trace gravel at 9-feet, fine to coarse, 1-inch maximum diameter	10 0
0 0		30			10	CL	SILTY CLAY brown (10YR4/3), 100% silty clay, slightly plastic, soft, moist, no odor, increasing gravel, fine to coarse, 1-inch maximum diameter Probable rock, no recovery below 12 5 feet	12 5
							NO RECOVERY	15 0
		0			15		NO RECOVERY Rock probably in front of sampler	20 0
		0			20		NO RECOVERY Rock probably in front of sampler Cuttings indicate a silty clay	25 0
0 0		18			25	CL	SILTY CLAY brown (10YR4/3), 100% silty clay, slightly plastic, firm, moist	26 5
							NO RECOVERY	30 0
0 0		12			30	CL	SILTY CLAY brown (10YR4/3), 100% silty clay, slightly plastic, firm, moist	31 0
							NO RECOVERY attached a standard split spoon to resample	32 0
0 0		12				CL	SILTY CLAY brown (10YR4/3), 100% silty clay, slightly plastic, firm, moist	33 0
							NO RECOVERY Broke some of a rock up and out, may work now	35 0
					35			

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-30697-TO5B INSTALL **BORING/WELL NUMBER** OW-4A

PROJECT NAME Omega Chemical **DATE DRILLED** 3/15/01

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	DEPTH (ft BGL)	U S C S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		0				NO RECOVERY Rock probably in front of sampler	40 0
0 0		24		40	CL	SILTY CLAY brown (10YR4/3), 100% silty clay, slightly plastic, firm, moist.	41 0
					ML	CLAYEY SILT brown (10YR4/3), 100% clayey silt, inelastic, soft, moist, no odor	42 0
						NO RECOVERY	45 0
		50 4		45	ML	CLAYEY SILT brown (10YR4/3), 100% clayey silt inelastic, soft, moist, no odor.	46 0
					CL	SILTY CLAY brown (10YR4/3), 100% silty clay, nonplastic, soft to moderately hard, firmer, moist, no odor	49 2
						NO RECOVERY	50 0
0 0		45 6		50	ML	SANDY SILT yellowish brown (10YR5/4), 70% silt, soft, 30% poorly graded sand, very fine to fine, subrounded	52 2
					SM	SILTY SAND brown (10YR5/3), 85% poorly graded sand, very fine to fine, subrounded, 15% silt, soft	53 8
						NO RECOVERY	55 0
0 0		51 6		55	SM	SILTY SAND brown (10YR5/3), 85% poorly graded sand, very fine to fine, subrounded, 15% silt, soft	57 0
					CL	SILTY CLAY WITH SAND brown (10YR4/3), 55% clay, nonplastic, firm, 25% silt, 20% poorly graded sand, very fine to fine, subrounded, moist, no odor	58 0
					SP	POORLY GRADED SAND brown (10YR4/3) and pale brown (10YR6/3), 100% sand, fine to medium, subangular to subrounded, very moist Encountered groundwater at 58-feet bgs.	59 3
						NO RECOVERY	60 0
0 0		50 4		60	SP	POORLY GRADED SAND brown (10YR4/3) and pale brown (10YR6/3), 100% sand, fine to medium, subangular to subrounded, saturated Encountered groundwater at 58-feet bgs.	63 4
					SM	SILTY SAND pale brown (10YR6/3), 65% poorly graded sand, very fine, subrounded, 35% silt, enough to limit permeability, moist, no odor	64 2
						NO RECOVERY	65 0
0 0		39 6		65	SM	SILTY SAND pale brown (10YR6/3), 65% poorly graded sand, very fine, subrounded, 35% silt, enough to limit permeability, moist, no odor	66 2
					SW	WELL GRADED SAND pale brown (10YR6/3), 100% sand, fine to coarse, subangular to subrounded, saturated, no odor	68 3
						NO RECOVERY	70 0
0 0		60		70	SW	WELL GRADED SAND (possible sluff) pale brown (10YR6/3), 100% sand, fine to coarse subangular to subrounded, saturated, no odor	73 0
				75	SP	POORLY GRADED SAND pale brown (10YR6/3), 100% sand, fine to medium, increasing fineness with depth, subangular to subrounded, saturated, no odor	75 0

WELL DIAGRAM

- 4", Sch 40, MS Blank (0 3 - 49 8 ft bgs)
- Portland Cement w/5% Bentonite Grout (2 - 42 5 ft bgs)
- Bentonite Chips (42 5 - 47 7 ft bgs)
- Lonestar #2/12 Filter Pack (47 7 - 75 7 ft bgs)
- 4", 20-slot, SS Wire Wrap Screen (49 8 - 69 8 ft bgs)
- 4", 20-slot, SS Wire Wrap Screen (69 8 - 74 8 ft bgs)

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-30697-TO5B INSTALL
BORING/WELL NUMBER OW-4A
PROJECT NAME Omega Chemical
DATE DRILLED 3/15/01

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0 0		48				SP		POORLY GRADED SAND pale brown (10YR6/3), 100% sand, fine to medium, increasing fineness with depth, subangular to subrounded, saturated, no odor	76 0	Fill (76 - 80 ft bgs)
						SW		WELL GRADED SAND WITH GRAVEL brown (10YR4/3), 70% sand, fine to coarse, subrounded to subangular, low to moderate sphericity, 30% gap graded gravel, fine to coarse, 2-inch maximum diameter, angular to subrounded, low to moderate sphericity, saturated, no odor	78 0	
						CL		GRAVELLY CLAY brown (10YR4/3), 60% clay, nonplastic, moderately firm, 25% gap graded gravel, fine to coarse, 2-inch maximum diameter, angular to subrounded, low to moderate sphericity, 15% gap graded sand, fine to coarse, subangular to subrounded, low to moderate sphericity, moist to saturated, no odor.	79 0	
					80			NO RECOVERY	80 0	

Total Depth of Borehole is 80 feet bgs

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-30697-TO5B.INSTALL
PROJECT NAME Omega Chemical
LOCATION 12504 East Whittier Blvd, Whittier, CA
DRILLING METHOD Mud Rotary
SAMPLING METHOD Grab Samples
GROUND ELEVATION 182.63
TOP OF CASING 182.22
LOGGED BY W.F. Grove
REMARKS Well is on north side of Washington Blvd., east of Lambert Rd.

BORING/WELL NUMBER OW-4B
DATE DRILLED 3/28/01
CASING TYPE/DIAMETER Sch 40, Mild Steel / 4"
SCREEN TYPE/SLOT 4" Stainless Steel Wire Wrap / 0.020"
GRAVEL PACK TYPE Lonestar #2/12
GROUT TYPE/QUANTITY Portland Cement/5% Bentonite/210 gal
STATIC WATER LEVEL (feet btoc) 61.67
GROUND WATER ELEVATION 120.55

(ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								ASPHALT is 4-inches thick	0.3	
								ROAD BASE	2.0	
						CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, slightly plastic, soft, moist, no odor.	5.0	
					5	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, slightly plastic, soft, moist, no odor. Trace gravel at 9-feet, fine to coarse, 1-inch maximum diameter.	10.0	4", Sch 40, MS Blank (0.3 - 112 ft bgs)
					10	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, slightly plastic, soft, moist, no odor; increasing gravel, fine to coarse, 1-inch maximum diameter. Probable rock, no recovery below 12.5 feet.	12.5	
								NO RECOVERY	16.0	
					15	CL		SILTY CLAY WITH GRAVEL: brown (10YR4/3); 100% silty clay, slightly plastic, soft, moist, no odor; increasing gravel, fine to coarse, 1-inch maximum diameter. Back to silty clay at 19 ft bgs.	19.0	
					20			NO RECOVERY	25.0	Portland Cement w/5% Bentonite Grout (2 - 105 ft bgs)
					25	CL		SILTY CLAY: brown (10YR4/3); 90% silty clay, slightly plastic, firm, moist; 10% gravel and rock fragments.	28.0	
					30	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, slightly plastic, firm, moist; trace gravel and rock fragments. SILTY CLAY: brown (10YR4/3), 100% silty clay, slightly plastic, firm, moist.	33.0	
					35			NO RECOVERY	35.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-30697-TO5B INSTALL **BORING/WELL NUMBER** OW-4B

PROJECT NAME Omega Chemical **DATE DRILLED** 3/28/01

Continued from Previous Page

(ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						CL		SILTY CLAY brown (10YR4/3), 80% silty clay, slightly plastic, firm, moist, 20% poorly graded sand, medium to coarse, angular to subrounded	37 0
								NO RECOVERY	40 0
					40	CL		SILTY CLAY brown (10YR4/3), 100% silty clay, slightly plastic, firm, moist.	41 0
						ML		CLAYEY SILT brown (10YR4/3), 100% clayey silt, inelastic, soft, moist, no odor.	42 0
								NO RECOVERY Below 43-feet, only trace sand	45 0
					45	ML		CLAYEY SILT brown (10YR4/3), 100% clayey silt, inelastic, soft, moist, no odor	46 0
						CL		SILTY CLAY brown (10YR4/3), 100% silty clay, nonplastic, soft to moderately hard, firmer, moist, no odor	49 2
								NO RECOVERY	50 0
					50	ML		SANDY SILT yellowish brown (10YR5/4), 70% silt, soft, 30% poorly graded sand, very fine to fine, subrounded	52 2
						SM		SILTY SAND brown (10YR5/3), 85% poorly graded sand, very fine to fine, subrounded, 15% silt, soft	53 8
								NO RECOVERY	55 0
					55	SM		SILTY SAND brown (10YR5/3), 85% poorly graded sand, very fine to fine, subrounded, 15% silt, soft	57 0
						CL		SILTY CLAY WITH SAND brown (10YR4/3), 55% clay, nonplastic, firm, 25% silt, 20% poorly graded sand, very fine to fine, subrounded, moist, no odor	58 0
						SP		POORLY GRADED SAND brown (10YR4/3) and pale brown (10YR6/3), 100% sand, fine to medium, subangular to subrounded, very moist Encountered groundwater at 58-feet bgs	59 3
								NO RECOVERY	60 0
					60	SP		POORLY GRADED SAND brown (10YR4/3) and pale brown (10YR6/3), 100% sand, fine to medium, subangular to subrounded, saturated Encountered groundwater at 58-feet bgs	63 4
						SM		SILTY SAND pale brown (10YR6/3), 65% poorly graded sand, very fine, subrounded, 35% silt, enough to limit permeability, moist, no odor	64 2
								NO RECOVERY	65 0
					65	SM		SILTY SAND pale brown (10YR6/3), 65% poorly graded sand, very fine, subrounded, 35% silt, enough to limit permeability, moist, no odor	66 2
						SW		WELL GRADED SAND pale brown (10YR6/3), 100% sand, fine to coarse, subangular to subrounded, saturated, no odor.	68 3
								NO RECOVERY	70 0
					70	SW		WELL GRADED SAND (possible sluff) pale brown (10YR6/3) 100% sand, fine to coarse, subangular to subrounded, saturated no odor	73 0
					75	SP		POORLY GRADED SAND pale brown (10YR6/3), 100% sand, fine to medium, increasing fineness with depth, subangular to subrounded, saturated, no odor	75 0

WELL DIAGRAM

4", Sch 40, MS Blank (0 3 - 112 ft bgs)

Portland Cement w/5% Bentonite Grout (2 - 105 ft bgs)

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-30697-TO5B INSTALL **BORING/WELL NUMBER** OW-4B
PROJECT NAME Omega Chemical **DATE DRILLED** 3/28/01

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(ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						SP		POORLY GRADED SAND pale brown (10YR6/3), 100% sand, fine to medium, increasing fineness with depth, subangular to subrounded, saturated, no odor	76 0	
						SW		WELL GRADED SAND WITH GRAVEL brown (10YR4/3), 70% sand, fine to coarse, subrounded to subangular, low to moderate sphericity, 30% gap graded gravel, fine to coarse, 2-inch maximum diameter, angular to subrounded, low to moderate sphericity, saturated, no odor	77 0	
						CL		GRAVELLY CLAY brown (10YR4/3), 60% clay, nonplastic, moderately firm, 25% gap graded gravel, fine to coarse, 2-inch maximum diameter, angular to subrounded, low to moderate sphericity, 15% gap graded sand, fine to coarse, subangular to subrounded, low to moderate sphericity, moist to saturated, no odor	78 0	
					80	SP		POORLY GRADED SAND 100% sand , fine to medium, subangular to subrounded, moderate sphericity, no odor Rig chatter at 86 feet bgs	80 0	
					85			NO RECOVERY		4", Sch 40, MS Blank (0 3 - 112 ft bgs)
						CL		CLAY no cuttings, lithology based on geophysical log	86 0	
					90					
					95			CLAY brown (10YR4/3), and POORLY GRADED SAND fine to medium, subangular to subrounded, moderate sphericity, no odor		Portland Cement w/5% Bentonite Grout (2 - 105 ft bgs)
								CLAY brown (10YR4/3)		
					100					
								CLAY WITH SAND		
								CLAY AND SAND		
					105			CLAY WITH SAND		
										Bentonite Pellets (105 - 109 5 ft bgs)
								SAND no cuttings, lithology based on geophysical log	108 0	
					110					Lonestar #2/12 Filter Pack (109 5 - 132 ft bgs)
					115					

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-30697-TO5B.INSTALL **BORING/WELL NUMBER** OW-4B

PROJECT NAME Omega Chemical **DATE DRILLED** 3/28/01

Continued from Previous Page

(ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					120	SP		Total depth of geophysical survey is 122 ft bgs.	122 0	4", 20-slot, SS Wire Wrap Screen (112 - 122.3 ft bgs)
					125 130	SP		SAND: No cuttings collected, lithology based upon the response of the drill rig.	132.0	4" Sch 40, Stainless Steel Blank (122 3 - 127.2 ft bgs) Lonestar #2/12 Filter Pack (109.5 - 132 ft bgs)
								Total Depth of Borehole is 132 feet bgs.		

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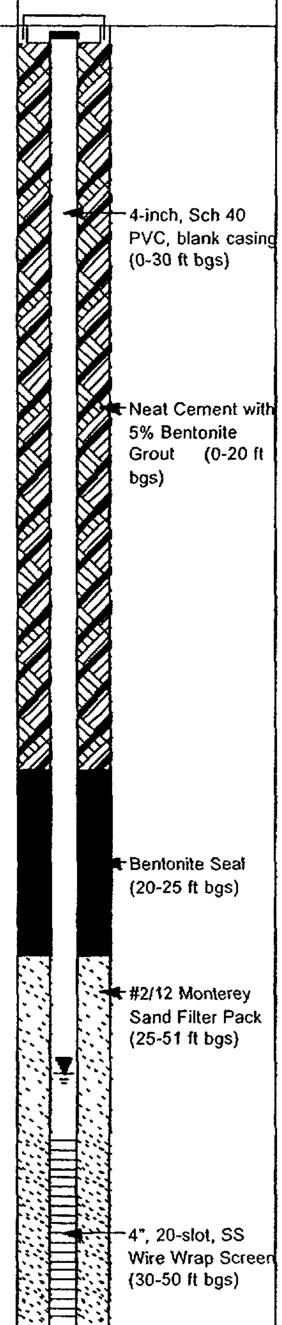
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-30697-TO5B.INSTALL	**BORING/WELL NUMBER**	OW-5
PROJECT NAME	Omega Chemical	**DATE DRILLED**	8/6/01
LOCATION	12504 East Whittier Blvd, Whittier, CA	**CASING TYPE/DIAMETER**	Sch 40, PVC / 4"
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	4" Stainless Steel Wire Wrap / 0.020"
SAMPLING METHOD	CME Continous Core	**GRAVEL PACK TYPE**	Monterey #2/12
GROUND ELEVATION	152.68	**GROUT TYPE/QUANTITY**	Portland Cement/5% Bentonite/210 gal
TOP OF CASING	151.96	**STATIC WATER LEVEL (feet btoc)**	28.18
LOGGED BY	Mike Hoffman	**GROUND WATER ELEVATION**	123.78
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
		60						ASPHALT is 6-inches thick.	0.5
						SM		SILTY SAND; very dark gray (10YR3/1); 85% poorly graded sand, fine grained; 15% silt in matrix; moist, slightly cohesive; organic odor.	
3 8		60			5			CLAY; very dark brown (10YR3/2); 100% clay, nonplastic, medium stiff; moist; numerous white inclusions.	5.0
0		60			10	CL		CLAY; as above except brown (10YR4/3) and contains trace fine gravel with subangular clasts.	
0		60			15			CLAY WITH SAND; dark yellow brown (10YR4/4); 85% clay, nonplastic, medium stiff; 15% fine sand; moist.	15.0
								CLAY; brown (10YR4/3); 100% clay; nonplastic, medium stiff; moist; numerous white inclusions.	16.5
0		60			20			CLAY; as above except dark yellow brown (10YR3/4).	
0		60			25	CL		NO RECOVERY (25-26.5 feet)	
								CLAY; as above except is low plastic; contains trace black inclusions; trace reddish (Fe) staining (weathering).	
0		42							
					30			CLAY; as above except dark greenish brown (10YR4/2); abundant mica; wet; lacks black and white inclusions.	
					35				

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-30697-TO5B.INSTALL **BORING/WELL NUMBER** OW-5
PROJECT NAME Omega Chemical **DATE DRILLED** 8/6/01

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		48						NO RECOVERY (35-36 feet)	36.0	#2/12 Monterey Sand Filter Pack (25-51 ft bgs)
						ML		SILT; very dark brown (10YR3/2); 100% silt, low plasticity, medium stiff; abundant mica; wet.	39.0	
0		42			40	SM		SILTY SAND; very dark green brown (10YR3/2); 70% sand, fine; 30% silt in matrix; micaceous; wet. NO RECOVERY (40-41.5 feet) SILTY SAND; as above.	42.5	
2.3						SW		SAND; olive brown (2.5Y4/3); 100% sand, fine to coarse grained, subrounded to subangular, well graded; trace fine gravel, diameters to 1/4 inch, subangular.	45.0	#2/12 Monterey Sand Filter Pack (25-51 ft bgs)
					45, 50	SP		SAND: lithology based on the response of the drill rig.	52.0	Slough

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-30697-TO5B.INSTALL	BORING/WELL NUMBER	OW-6
PROJECT NAME	Omega Chemical	DATE DRILLED	3/16/01
LOCATION	12504 East Whittier Blvd, Whittier, CA	CASING TYPE/DIAMETER	Sch 40, Mild Steel / 4"
DRILLING METHOD	Hollow Stem Auger	SCREEN TYPE/SLOT	4" Stainless Steel Wire Wrap / 0.020"
SAMPLING METHOD	CME Continous Core	GRAVEL PACK TYPE	Lonestar #2/12
GROUND ELEVATION	170.94	GROUT TYPE/QUANTITY	Portland Cement/5% Bentonite/210 gal
TOP OF CASING	170.54	STATIC WATER LEVEL (feet btoc)	43.95
LOGGED BY	W.F. Grove	GROUND WATER ELEVATION	126.59

REMARKS Well is on west side of Lambert Rd., south of Washington Blvd.

(ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
								ASPHALT is 4-inches thick.	0.3
								ROAD BASE	2.0
						CL		SILTY CLAY: dark grayish brown (10YR4/2); 100% silty clay, slightly plastic, moist, no odor.	5.0
0.0		36			5	CL		SILTY CLAY: brown (10YR5/3) with heavy mottling from 7' to 8'; 100% silty clay grading to clay, slightly plastic; trace gravel, fine, 1/2-inch maximum diameter; moist, no odor.	8.0
								NO RECOVERY	10.0
0.0		55.2			10	CL		SILTY CLAY: brown (10YR4/3) moderate to heavy mottling; 85% clay, 15% silt, slightly plastic; trace gravel; moist, no odor.	12.0
						CL		CLAY: brown (10YR4/3) mottled; 90% clay, slightly plastic; 10% gravel, fine, 1/2-inch maximum diameter, increasing with depth; moist, no odor.	14.6
								NO RECOVERY	15.0
0.0		36.08			15	ML		CLAYEY SILT: brown (10YR4/3) mottling; 100% clayey silt, firm; trace gravel, fine, 3/4-inch maximum diameter; moist, no odor.	18.1
								NO RECOVERY	20.0
0.0		60			20	CL		SILTY CLAY: brown (10YR4/3) slight mottling; 100% clay, nonplastic, firm, moist, no odor.	
0.0		55.2			25			SILTY CLAY: brown (10YR4/3) slight mottling; 100% clay, nonplastic, firm, moist, no odor.	29.6
								NO RECOVERY	30.0
0.0		47			30	CL		SILTY CLAY: brown (10YR4/3) slight mottling; 100% clay, nonplastic, firm, moist, no odor.	33.9
								NO RECOVERY	35.0
					35				

WELL DIAGRAM

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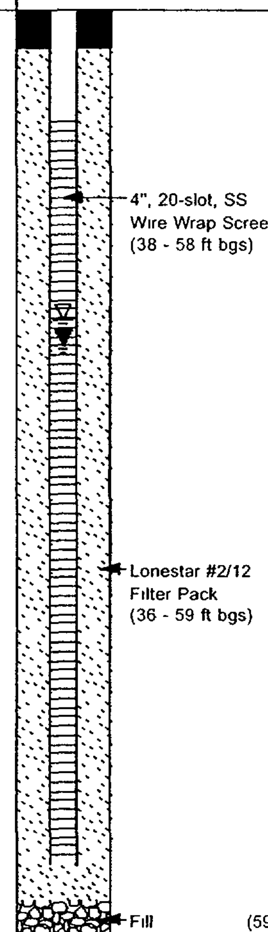
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-30697-TO5B INSTALL **BORING/WELL NUMBER** OW-6
PROJECT NAME Omega Chemical **DATE DRILLED** 3/16/01

Continued from Previous Page

(ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0 0		60				CL		SILTY CLAY brown (10YR4/3) slight mottling, 100% clay nonplastic, firm, moist, no odor	36 8
						ML		SANDY SILT brown (10YR4/3), 70% silt, moderately soft, 30% poorly graded sand, very fine, subrounded, moist, no odor	38 2
						SM		SILTY SAND brown (10YR4/3), 70% poorly graded sand, very fine, subrounded, 30% silt, soft, moist, no odor	39 2
					40	ML		SANDY SILT brown (10YR4/3), 70% silt, moderately soft, 30% poorly graded sand, very fine, subrounded, moist, no odor	40 0
0 0		39 6				SP		POORLY GRADED SAND brown (10YR4/3), 100% sand, very fine to fine, subrounded, trace silt, moist, no odor	42 2
						SM		SILTY SAND brown (10YR4/3), 70% sand, very fine to fine, subrounded, 30% silt, soft, moist, no odor	42 8
						SP		POORLY GRADED SAND pale brown (10YR6/3), 100% sand fine to medium, subangular to subrounded, trace silt, wet, no odor	43 3
		0			45			NO RECOVERY	
0 0		42			50	SP		POORLY GRADED SAND (SLUFF) brown (10YR5/3), 100% flowing sand, fine, some medium, trace coarse, saturated, no odor	50 0
								NO RECOVERY	53 5
0 0		60			55	SP		POORLY GRADED SAND (SLUFF) brown (10YR5/3), 100% flowing sand, fine some medium, trace coarse, saturated, no odor	55 0
0 0		18			60				
								Total Depth of Borehole is 61 5 feet bgs	61 5

WELL DIAGRAM



NEWGINT OMEGA GPJ NEWGINT GDT 12/20/01

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-30697-TO5B.INSTALL	BORING/WELL NUMBER	OW-7
PROJECT NAME	Omega Chemical	DATE DRILLED	3/13/02
LOCATION	12504 East Whittier Blvd, Whittier, CA	CASING TYPE/DIAMETER	Sch 40, Mild Steel / 4"
DRILLING METHOD	Hollow Stem Auger	SCREEN TYPE/SLOT	4" Stainless Steel Wire Wrap / 0.020"
SAMPLING METHOD	Modified CA Split Spoon	GRAVEL PACK TYPE	Monterey #2/12
GROUND ELEVATION	213.34	GROUT TYPE/QUANTITY	Portland Cement/5% Bentonite
TOP OF CASING	212.01	STATIC WATER LEVEL (feet btoc)	76.00
LOGGED BY	W.F. Grove	GROUND WATER ELEVATION	136.01
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
								CONCRETE is 8 inches thick.	0.7
								ROADBASE	1.0
						CL		CLAY: brown (7.5YR4/3); slightly plastic, soft, moist; minor rock.	
	8,9, 10	12			5				
	4,7, 11	14				ML		CLAYEY SILT: brown (7.5YR4/3); very slightly plastic, soft, moist; 30% clay, 70% silt.	6.5
0	5,6, 11,12	20				CL		SILTY CLAY: brown (7.5YR4/3); very slightly plastic, soft, moist; approximately 15% coarse sand; trace gravel to 25 mm.	7.5
	3,11, 13	12			10				
	7,14, 16	14							
0	9,7, 14,16	21							
	11,12, 19	14			15	CL		CLAY: brown (7.5YR4/3); slightly plastic, moderately firm, moist; 15% silt; trace rock to 25mm; no staining or odor.	15.0
	9,14, 16	16							
0	12,18, 20,22	23							
	3,9, 14	18			20			1" thick, medium to coarse sand lens.	
	10,16, 21	18				CL		SILTY CLAY: brown (7.5YR4/3); slightly plastic, soft, moist; 35% silt; trace gravel to 10 mm; no staining or odor.	21.5
0	11,14, 20,22	22							
	5,9, 16	10			25				
	11,16, 23	16							
0	8,12, 15,26	24							
						ML		SILT: brown (7.5YR5/4); nonplastic to very slightly plastic; 20% clay; 5% gravel to 25 mm. Sand stringer at 29.6 feet bgs, fine to coarse, well graded, angular to subrounded.	29.0
	9,13, 21	18			30	CL		CLAY: brown (7.5YR4/3); nonplastic to very slightly plastic, firm, moist; 15% silt; no staining or odor.	30.0
	6,18, 20	13							
0	12,13, 22,30	22				CL		CLAY: brown (7.5YR4/3), slightly mottled; nonplastic to very slightly plastic, firm, moist; 15% silt; no staining or odor.	33.0
					35				35.0

WELL DIAGRAM

4" diameter, sch 40, mild steel blank (0-70.89 ft bgs).

Portland cement w/5% bentonite grout (2-60.6 ft bgs).

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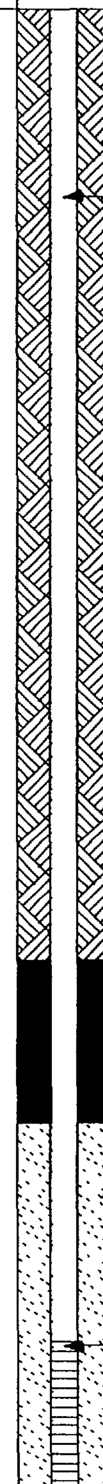
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-30697-TO5B INSTALL **BORING/WELL NUMBER** OW-7
PROJECT NAME Omega Chemical **DATE DRILLED** 3/13/02

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	DEPTH (ft. BGL)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
	7,7, 22	12				SILTY CLAY brown (7 5YR4/3), very slightly plastic, firm, moist, 30% silt, no staining or odor	
	12,17, 24	10					
0	10,17, 20,24	23			CL		
				40			
	18,20, 30	18					41 5
	12,19, 22	18			ML	CLAYEY SILT brown (7 5YR4/3), very slightly plastic, soft, moist, 35% clay; 5% very fine sand, no staining or odor	43 0
0	10,11, 16,30	18				SILTY CLAY brown (7 5YR4/3), very slightly plastic, firm, moist, root structures filled with very light brown clay, 20% silt, trace coarse sand, no staining or odor	
				45			
	5,7, 21	12					
	17,18, 20	18					
0	11,20, 22,23	18			CL		
				50			
	5,19, 20	16					
	16,22, 25	16					
0	14,27, 30,34	18				Increase in very light brown clay filling cracks	
				55			55 0
	17,20, 32	16			CL	SILTY CLAY brown (7 5YR4/3), very slightly plastic, firm, moist, root structures filled with very light brown clay, 20% silt, 5% gravel, 5 to 25 mm diameter, angular, trace coarse sand, no staining or odor Sandy silt stringer at 57 feet bgs	
	29,30, 57	15					58 0
0	12,18, 21,27	20			ML	SANDY SILT brown (7 5YR5/4), nonplastic, soft, moist, 35% very fine sand, poorly graded, subrounded, very light brown clay filling fractures and other voids, no staining or odor	
				60			60 5
	13,17, 23	17				SILTY CLAY brown (7 5YR4/3), very slightly plastic, firm, moist, 20% silt, fractures filled with very light brown clay, no staining or odor, silt and moisture content increase with depth	
	16,18, 25	17					
0	5,7, 20,23	19			CL		
				65			
	10,19, 26	18					
	15,16, 23	18					67 0
0	4,16, 17 24	24			CL	SILTY CLAY brown (7 5YR4/3), very slightly plastic, very firm, moist, 20% silt, minor very light brown clay in fractures, no staining or odor	69 7
				70	SM	SILTY SAND brown (7 5YR5/4), 70% sand, very fine to coarse, well graded, subangular to subrounded, 25% silt, 5% gravel to 25 mm, no odor, moist	70 2
	18,22 29	18					
	15,28, 30	18			CL	CLAY brown (7 5YR4/3), moist, 15% silt, very light brown clay in minor fractures or root structures, trace gravel to 25 mm, angular to subangular, no staining or odor	
0	16,20, 45,_	20					
				75			75 0

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

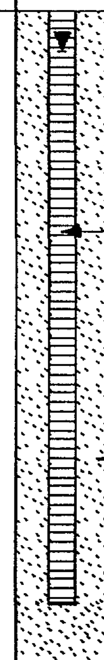
PROJECT NUMBER 10500-30697-TO5B.INSTALL **BORING/WELL NUMBER** OW-7

PROJECT NAME Omega Chemical **DATE DRILLED** 3/13/02

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
	7,9, 11	18						SILTY CLAY: brown (7.5YR5/4); slightly plastic, moist; 25% silt; trace gravel to 25 mm; no staining or odor.	
	3,14, 16	18							
0	3,8, 14,21	23				CL			
					80			Vertical crack filled with sand and very light clay from 79 to 80 ft bgs.	
	11,17, 20	18							
	13,16, 27	17						Groundwater at 81 ft bgs, saturated sand and gravel lens.	82.5
0	8,14, 16,24	24				ML		SANDY CLAYEY SILT: brown (7.5YR4/3); nonplastic to very slightly plastic, saturated; 20% clay; 15% very fine sand; minor very light brown clay; no staining or odor.	84.0
	6,14, 13	18			85			SANDY CLAYEY SILT: brown (7.5YR4/3), nonplastic, hard, moist; very minor very light brown clay in voids; no staining or odor. No water in this material.	
	10,16, 21	18				ML			
0	5,7, 10,12	20							90.0
					90			Total Depth of 8-inch pilot hole is 90 ft bgs, no further samples collected.	92.0
								Total depth of 10-inch borehole is 92 ft bgs.	

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-30697-TO5B INSTALL	**BORING/WELL NUMBER**	OW-8
PROJECT NAME	Omega Chemical	**DATE DRILLED**	3/13/02
LOCATION	12511 Putnam St, Whittier, CA	**CASING TYPE/DIAMETER**	Sch 40, Mild Steel / 4"
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	4" Stainless Steel Wire Wrap / 0 020"
SAMPLING METHOD	Modified CA Split Spoon	**GRAVEL PACK TYPE**	Monterey #2/12
GROUND ELEVATION	199 03	**GROUT TYPE/QUANTITY**	Portland Cement/5% Bentonite
TOP OF CASING	198 42	**STATIC WATER LEVEL (feet btoc)**	65 00
LOGGED BY	W F Grove	**GROUND WATER ELEVATION**	133 42
REMARKS			

Samples

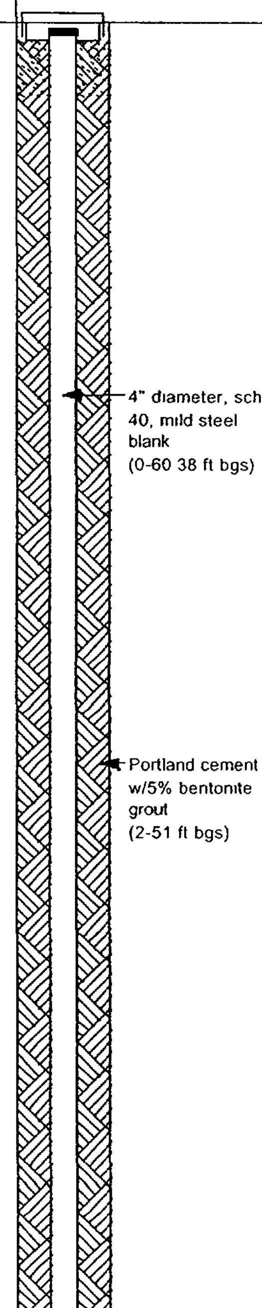
PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.
	5,6, 7	18	
	3,4, 5	18	
0	9,10, 11,12	23	
	8,10, 12	18	
	7,9, 11	17	
0	50,50	17	
	21,40, 50	17	
	17,21, 25	18	
0	16,22, 25,30	23	
	12,17, 21	18	
	13,18, 24	17	
2/0	22,29, 50,	18	
	15,16, 20	17	
	15,22, 29	18	
4/0	18,20, 25,30	23	
	41,50	14	
	25,26, 31	18	
4/0	18,23, 26,30	18	

Lithology

U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
	CONCRETE is 7 inches thick	0 6
	ROADBASE	1 0
CL	SILTY CLAY brown (7 5YR4/3), 70% clay with minor rock fragments to 3-inch diameter (probable fill), very slightly plastic, firm, hard to dig, moist, 30% silt, moist, no odor	2 0
ML	SILT light brown (7 5YR6/4), nonplastic, soft, moist to damp no odor	14 0
CL	CLAY brown (7 5YR4/2), very slightly plastic, hard, firm, no staining or odor	15 0
CL	SILTY CLAY brown (7 5YR4/2), very slightly plastic, firm, moist, 30% silt, gravel/clay lens - trace gravel to 20 mm through out	21 0
CL	CLAY brown (7 5YR4/2) very slightly plastic, hard, moist, less than 10% silt	26 0
SW	SAND brown (7 5YR4/3), fine to coarse, well graded, subangular to subrounded, moist, grading to very fine to fine, poorly graded, subrounded at 27 feet, no odor	27 0
ML	SILT brown (7 5YR4/3), nonplastic, soft, no staining or odor	28 0
CL	CLAY brown (7 5YR4/3), very slightly plastic, hard, trace coarse sand to 5 mm, trace light brown clay in voids and cracks, no staining or odor	30 5
CL	SILTY CLAY brown (7 5RY4/3), very slightly plastic, firm/hard, moist, 30% silt, trace coarse sand, no staining or odor	

DEPTH (ft. BGL): 5, 10, 15, 20, 25, 30, 35

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-30697-TO5B.INSTALL **BORING/WELL NUMBER** OW-8
PROJECT NAME Omega Chemical **DATE DRILLED** 3/13/02

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
	14,17, 22	18								
	16,19, 26	17						SILT: brown (7.5YR4/3); nonplastic to very slightly plastic, soft to medium; interbedded with 3-inch thick clay stringers.	37.0	
	20,24, 29,40	20				ML				
18/0	23,27, 41	18			40			SILTY CLAY: brown (7.5YR4/3); very slightly plastic, firm to hard, moist; trace gravel to 5 mm; no staining or odor.	40.0	4" diameter, sch 40, mild steel blank (0-60.38 ft bgs).
	20,25, 32	14				CL				
	22,25, 27,27	22								
10/0	8,12, 15	17			45	ML		SILT: brown (7.5YR4/3); nonplastic, medium soft, moist; trace clay; no staining or odor.	44.5	Portland cement w/5% bentonite grout (2-51 ft bgs).
	12,15, 21	16						SANDY SILT: light brown (7.5YR6/4); soft, moist; 35% very fine sand, poorly graded, subrounded; no staining or odor.	47.0	
	19,23, 26,28	20								
18/2	17,21, 27	17			50	ML				
	15,20, 24	17								3/8" pressed, uncoated bentonite pellets (60.6-65 ft bgs).
4/2	29,50, 50,	18						SAND: light brown (7.5YR6/4); clean sand, very fine to fine, poorly graded, subrounded, moist, no staining or odor.	54.0	
	19,24, 28	16			55					
	17,20, 25	14								
4/2	50,50	12				SP				
	37,50	12			60					#2/12 Monterey sand (55-81 ft bgs).
	42,50	14								
2/0	50,50	12				SP		SAND: light brown (7.5YR6/4); clean sand, very fine to medium, poorly graded, subrounded, moist, no staining or odor.	63.0	
	29,50	15			65			SAND: light brown (7.5YR6/4); clean sand, very fine to medium, poorly graded, subrounded, saturated, no staining or odor. Groundwater encountered at 65 ft bgs.	65.0	
	28,50	14								
28/0	18,21, 25,30	22				SP				
	20,23, 28	16			70					4" diameter, 0.020", stainless steel, wire wrap screen (60.38-79.98 ft bgs).
	15,19, 22	15						SAND: light brown (7.5YR6/4); fine to coarse, well graded, subangular to subrounded, saturated, no staining or odor Sand heaving at 75 ft bgs.	72.0	
4/0	13,15, 19,22	24				SW				
					75				75.0	

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NEWGINT OMEG...J NEWGINT.GDT 5/20/02

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-30697-TO5B INSTALL **BORING/WELL NUMBER** OW-8

PROJECT NAME Omega Chemical **DATE DRILLED** 3/13/02

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
	50 50	18 18				SW		SAND light brown (7 5YR6/4), medium to coarse, minor fine, well graded, subangular to subrounded, saturated	78 0	4" diameter, 0 020", stainless steel, wire wrap screen (60 38-79 98 ft bgs)
2/0	50	10			80	ML		SANDY SILT brown (7 5YR4/3), nonplastic, firm, moist, 25-30% very fine sand, 5% gravel to 10 mm, light brown clay filling cracks and fractures	80 0	
								Total Depth of 8-inch pilot hole is 80 ft bgs, no further samples collected	81 0	
								Total Depth of 10-inch borehole is 81 ft bgs		

NEWGINT OMEGA GPJ NEWGINT GDT 5/20/02

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-37240-T1.GW.Phase1a	**BORING/WELL NUMBER**	OW-8B REV
PROJECT NAME	Omega Chemical	**DATE DRILLED**	8/16/04
LOCATION	12511 Putnam St, Whittier, CA	**CASING TYPE/DIAMETER**	Sch 40, PVC / 4"
DRILLING METHOD	Mud Rotary	**SCREEN TYPE/SLOT**	4" Stainless Steel Wire Wrap / 0.020"
SAMPLING METHOD	Mud Rotary Cuttings	**GRAVEL PACK TYPE**	Monterey #2/12
GROUND SURFACE ELEVATION (FT MSL)	NA	**GROUT TYPE/QUANTITY**	Portland Cement/5% Bentonite
TOP OF CASING ELEVATION (FT MSL)	NA	**STATIC WATER LEVEL (FT BELOW TOC)**	NM
LOGGED BY	W.F. Grove	**GROUND WATER ELEVATION (FT MSL)**	

REMARKS The lithology at OW-08 (10' north), was used from 0-71'. The geophysical log and cuttings were used from 71' to the total depth of 143'.

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.
	5,6,7	18	
	3,4,5	18	
0	9,10,11,12	23	
	8,10,12	18	
	7,9,11	17	
0	50,50	17	
	21,40,50	17	
	17,21,25	18	
0	16,22,25,30	23	
	12,17,21	18	
	13,18,24	17	
2/0	22,29,50,	18	
	15,16,20	17	
	15,22,29	18	
4/0	18,20,25,30	23	
	41,50	14	
	25,26,31	18	
4/0	18,23,26,30	18	

U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
	CONCRETE is 7 inches thick.	0.6
	ROADBASE	1.0
CL	SILTY CLAY: brown (7.5YR4/3); 70% clay with minor rock fragments to 3-inch diameter (probable fill), very slightly plastic, firm, hard to dig, moist; 30% silt; moist, no odor.	2.0
ML	SILT: light brown (7.5YR6/4); nonplastic, soft, moist to damp, no odor.	14.0
CL	CLAY: brown (7.5YR4/2); very slightly plastic, hard, firm, no staining or odor.	15.0
CL	SILTY CLAY: brown (7.5YR4/2); very slightly plastic, firm, moist; 30% silt; gravel/clay lens - trace gravel to 20 mm through out	21.0
CL	CLAY: brown (7.5YR4/2); very slightly plastic, hard, moist; less than 10% silt.	26.0
SW	SAND: brown (7.5YR4/3); fine to coarse, well graded, subangular to subrounded, moist; grading to very fine to fine, poorly graded, subrounded at 27 feet, no odor.	27.0
ML	SILT: brown (7.5YR4/3); nonplastic, soft, no staining or odor.	28.0
CL	CLAY: brown (7.5YR4/3); very slightly plastic, hard; trace coarse sand to 5 mm; trace light brown clay in voids and cracks, no staining or odor.	30.5
CL	SILTY CLAY: brown (7.5RY4/3); very slightly plastic, firm/hard, moist; 30% silt; trace coarse sand; no staining or odor.	

DEPTH (ft. bgs): 5, 10, 15, 20, 25, 30, 35

WELL DIAGRAM

- Concrete (0-2 ft bgs)
- 12" x 3/8" mild steel conductor casing (0-91.4 ft bgs)
- 4" sch 40 pvc, blank casing (0-116 ft bgs)
- Portland cement w/ 5% bentonite gel grout (2 - 110 ft bgs)

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW Phase1a **BORING/WELL NUMBER** OW-8B REV
PROJECT NAME Omega Chemical **DATE DRILLED** 8/16/04

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	DEPTH (ft bgs)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
	14,17,22	18					
	16,19,26	17			ML	SILT: brown (7.5YR4/3); nonplastic to very slightly plastic, soft to medium; interbedded with 3-inch thick clay stringers.	37.0
	20,24,29,40	20					
18/0	23,27,41	18		40	CL	SILTY CLAY: brown (7.5YR4/3); very slightly plastic, firm to hard, moist; trace gravel to 5 mm; no staining or odor.	40.0
	20,25,32	14					
	22,25,27,27	22					
10/0	8,12,15	17		45	ML	SILT: brown (7.5YR4/3); nonplastic, medium soft, moist; trace clay; no staining or odor.	44.5
	12,15,21	16			ML	SANDY SILT: light brown (7.5YR6/4); soft, moist; 35% very fine sand, poorly graded, subrounded; no staining or odor.	47.0
	19,23,26,28	20					
18/2	17,21,27	17		50			
	15,20,24	17					
4/2	29,50,50,	18					
	19,24,28	16		55	SP	SAND: light brown (7.5YR6/4); clean sand, very fine to fine, poorly graded, subrounded, moist, no staining or odor.	54.0
	17,20,25	14					
4/2	50,50	12					
	37,50	12		60			
	42,50	14					
2/0	50,50	12			SP	SAND: light brown (7.5YR6/4); clean sand, very fine to medium, poorly graded, subrounded, moist, no staining or odor.	63.0
	29,50	15		65	SP	SAND: light brown (7.5YR6/4), clean sand, very fine to medium, poorly graded, subrounded, saturated, no staining or odor. Groundwater encountered at 65 ft bgs.	65.0
	28,50	14					
28/0	18,21,25,30	22					
	20,23,28	16		70		The lithology above 71 feet is from soil boring OW-8 from split spoon sampling. The lithology below 71 feet is from OW-8B, a mud rotary hole.	
					CL	CLAY AND SILT: yellowish brown, 70% clay; 30% silt; high plasticity, high density, moist, no odor.	71.0
				75			75 0

WELL DIAGRAM

- 12" x 3/8" mild steel conductor casing (0-91.4 ft bgs)
- 4" sch 40 [illegible] blank casi[illegible] (0-116 ft bgs)
- Portland cement w/ 5% bentonite gel grout (2 - 110 ft bgs)

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a
BORING/WELL NUMBER OW-8B REV
PROJECT NAME Omega Chemical
DATE DRILLED 8/16/04

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						CL		CLAY AND SILT: yellowish brown; 70% clay; 30% silt; high plasticity, high density, moist, no odor.	78.0	
						ML		SANDY SILT: yellowish brown, 50% silt; 30% sand, fine grained, subround to round; 10% gravel, fine to coarse grained, subround to round; 10% clay; medium density, moist, no odor.	79.0	
					80	SM		SILTY SAND WITH GRAVEL: yellowish brown; 50% sand, fine to coarse grained, subround to round, well graded; 20% silt; 20% gravel, fine to coarse grained, subround to round, well graded; 10% clay; moist to wet, no odor.	80.0	Portland cement w/ 5% bentonite gel grout (2 - 110 ft bgs)
					85	GM		SILTY GRAVEL WITH SAND: brown, 40% gravel, fine to coarse grained, subround to round, well graded; 30% sand, fine to coarse grained, round to subround, well graded; 30% silt; trace of cobbles, maximum diameter of 6 inches; high density, moist, no odor.	87.0	4" sch 40 pvc, blank casing (0-116 ft bgs)
					90	CL		CLAY WITH SAND: brown; 85% clay, medium plasticity; 15% sand, poorly graded, fine to medium, mostly fine, subangular to subrounded.	92.0	12" x 3/8" mild steel conductor casing (0-91.4 ft bgs)
				G	95, 100	CH		CLAY: brown; 95% clay, medium to high plasticity; 5% sand, poorly graded, medium, subangular to subrounded; trace silt.	102.0	
					105	CL		CLAY: brown; 80% clay, 10% silt, medium plasticity; 10% sand, poorly graded, fine to medium, subangular to subrounded.	108.0	
						CH		CLAY: brown; 95% clay, high plasticity; 5% sand, poorly graded, fine to medium, subangular to subrounded.	110.0	
					110	CL		CLAY WITH SAND· brown; 85% clay, medium plasticity; 15% sand, poorly graded, fine to medium, subangular to subrounded; trace silt.	113.0	Plaster sand (110-111.3 ft bgs)
					115	ML		SANDY SILT: brown, 55% silt, 10% clay, low plasticity; 35% sand, fine to medium, subangular to subrounded	115 0	

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BORING/WELL CONSTRUCTION LOG

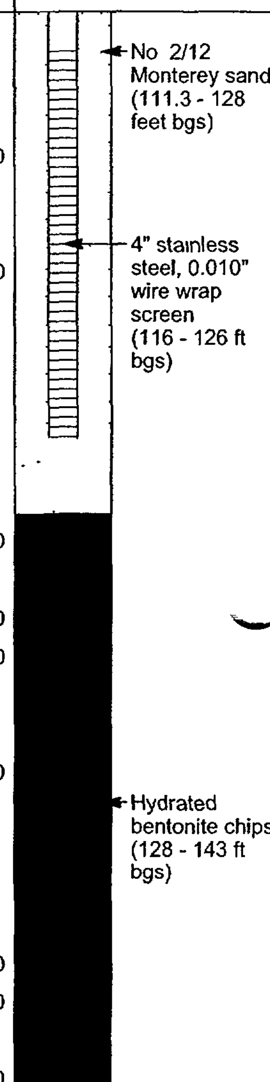
PROJECT NUMBER 10500-37240-T1.GW.Phase1a **BORING/WELL NUMBER** OW-8B REV

PROJECT NAME Omega Chemical **DATE DRILLED** 8/16/04

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
						ML		SANDY SILT brown; 55% silt, 10% clay, low plasticity, 35% sand, fine to medium, subangular to subrounded.	119.0
					120	SM		SILTY SAND: light brown and brown; 80% sand, poorly graded, fine to medium, subangular to rounded; 20% silt, nonplastic	122 0
				G	125	SP SM		SAND WITH SILT: light brown; 95% sand, poorly graded, fine to medium, mostly fine, subangular to rounded, 5% silt, nonplastic.	129 0
					130	CL		CLAY: light brown; 90% clay, medium plasticity; 10% sand.	131.0
						SP SM		SAND WITH SILT light brown; 95% sand, poorly graded, fine to medium, mostly fine, subangular to subrounded, 5% silt, nonplastic	132.0
						CL		CLAY· light brown, 90% clay, medium plasticity; 10% sand, poorly graded, fine to medium, mostly fine, subangular to subrounded	135 0
					135	SP		SAND: light brown, 100% sand, poorly graded, fine to medium, mostly fine, subangular to subrounded.	140 0
					140	CL		CLAY· light brown; 90% clay, medium plasticity, 10% sand, poorly graded, fine to medium, mostly fine, subangular to subrounded	141.0
						SP		SAND: light brown, 100% sand, poorly graded, fine to medium, mostly fine, subangular to subrounded.	143 0
								Total depth is 143 feet bgs.	

WELL DIAGRAM



CDM
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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD
PROJECT NAME Omega Chemical
LOCATION 12504 East Whittier Blvd., Whittier CA
DRILLING METHOD Direct Push
SAMPLING METHOD Macrocore
GROUND SURFACE ELEVATION (FT MSL) NA
TOP OF CASING ELEVATION (FT MSL) NA
LOGGED BY R. Douglas
REMARKS

BORING/WELL NUMBER GP-1
DATE DRILLED 10/27/03
CASING TYPE/DIAMETER NA
SCREEN TYPE/SLOT NA
GRAVEL PACK TYPE NA
GROUT TYPE/QUANTITY Hydrated Bentonite Chips
STATIC WATER LEVEL (FT BELOW TOC) 77.00
GROUND WATER ELEVATION (FT MSL)

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								Concrete thickness is 6 inches.	0.5	No well was constructed.
					5	CL		SILTY CLAY: very dark greyish brown (10 YR 3/2); 95% silt - clay; 5% gravel, coarse grained, subangular to subround; low plasticity, soft, dry to moist, no odor.	8.0	
						SP		SAND WITH GRAVEL: yellowish brown (10 YR 5/4); 80% sand, fine to medium grained, subangular to angular; 20% gravel, coarse grained, subangular to angular; dry, no odor.	9.0	
1.4/0.7		48			10			SILTY CLAY: very dark greyish brown (10 YR 3/2); 95% silt - clay; 5% gravel, coarse grained, subangular to subround; low plasticity, soft, dry to moist, no odor. UV = Numerous grains and streaks - short wave.		
2.1/0.7		48			15	CL		SILTY CLAY: brown (10 YR 4/3); 95% silt - clay; 5% gravel, coarse grained, subangular to subround; low plasticity, soft, moist, no odor. UV = Numerous grains - short wave.		
1.4/0.7		60			20					

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-1
PROJECT NAME Omega Chemical **DATE DRILLED** 10/27/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								UV = Isolated streaks and grains - short wave.	21.0	
						SP		SAND WITH GRAVEL: yellowish brown (10 YR 5/4); 80% sand, fine to medium grained, subangular to angular; 20% gravel, coarse grained, subangular to angular; dry, no odor.	21.5	
						CL		SILTY CLAY: brown (10 YR 4/3); 100% silt - clay; trace of gravel, coarse grained, subangular to subround; low plasticity, soft, moist, no odor.		
1.4/0.7		60			25			UV = Isolated streak - short wave.		
								SILTY CLAY: brown (10 YR 4/3); 95% silt - clay; 5% gravel, coarse grained, subangular to subround; low plasticity, soft, moist, no odor.		
								SILTY CLAY: brown (10 YR 4/3); 95% silt - clay; 5% gravel, coarse grained, subangular to subround; low plasticity, soft, moist, no odor.		
1.4/0.7		60			30			UV = Isolated grains - short wave only.	31.0	
						SP		SAND WITH GRAVEL: yellowish brown (10 YR 5/4); 80% sand, fine to medium grained, subangular to angular; 20% gravel, coarse grained, subangular to angular; dry, no odor.	31.5	
						CL		SILTY CLAY: brown (10 YR 4/3); 95% silt - clay; 5% gravel, coarse grained, subangular to subround; low plasticity, soft, moist, no odor.	33.0	
						SP		SAND WITH GRAVEL: yellowish brown (10 YR 5/4); 80% sand, fine to medium grained, subangular to angular; 20% gravel, coarse grained, subangular to angular; dry, no odor.	33.5	
						CL		SILTY CLAY: brown (10 YR 4/3); 95% silt - clay; 5% gravel, coarse grained, subangular to subround; low plasticity, soft, moist, no odor.	34.0	
						SP		SAND WITH GRAVEL: yellowish brown (10 YR 5/4); 80% sand, fine to medium grained, subangular to angular; 20% gravel, coarse grained, subangular to angular; dry, no odor.	34.5	
1.4/0.7		60			35	CL		CLAY: brown (10 YR 4/3); 100% clay; stiff, moist, no odor. UV = Isolated grains - short wave only.		
1.4/0.7		60			40			UV = Streaks with long and short wave.	41.0	
						SP		SAND: yellowish brown (10 YR 5/4); 100% sand, fine to medium grained, poorly graded; dry to moist, no odor.	42.0	
						CL		CLAY: brown (10 YR 4/3); 100% clay; stiff, moist, no odor.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-1
PROJECT NAME Omega Chemical **DATE DRILLED** 10/27/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						ML		SILT: brown (10 YR 4/3); 100% silt, soft, moist, no odor.	43.0	
1.4/0.7		60			45			UV = Few grains - short wave.		
						CL		CLAY: brown (10 YR 4/3); 100% clay; stiff, low to moderate plasticity, moist, no odor.	47.0	
2.9/0.7		60			50			UV = Few grains - short wave.		
								CLAY: brown (10 YR 4/3); 100% clay; very stiff, moist, no odor.		
2.9/0.7		36			55			UV = Nothing observed.		
						SP		SAND WITH GRAVEL: yellowish brown (10 YR 5/4); 80% sand, fine to medium grained, subangular to angular; 20% gravel, coarse grained, subangular to angular; dry, no odor.	56.0	
						CL		CLAY WITH SILT: brown (10 YR 4/3); 80% clay; 20% silt; stiff, moist, no odor.	56.5	
5.1/0.7		60			60			UV = Few grains - short wave.		
						ML		SILT WITH SAND: yellowish brown (10 Y 5/4); 70% silt, soft; 30% sand; no odor.	61.0	
								CLAY WITH SILT: yellowish brown (10 YR 6/7); 80% clay; 20% silt; stiff, moist, no odor.	62.0	
5.1/0.7		60			65			UV = Grains and streaks - short wave.		

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BORING/WELL CONSTRUCTION LOG

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PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-1
PROJECT NAME Omega Chemical **DATE DRILLED** 10/27/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								CLAY WITH SILT: yellowish brown (10 YR 6/7); 80% clay; 20% silt; stiff, moist, PCE odors.		
4.5/0.7		60			70	CL		UV = Streaks and specks - short wave.		
								CLAY WITH SILT: yellowish brown (10 YR 6/7); 80% clay; 20% silt; stiff, moist, mild chlorinated odor.		
29.1/0.7		60			75			UV = Streaks and grains - short wave.		
						ML		SILT WITH GRAVEL: brown (10 Y 4/3); 60% silt, soft; 25% gravel, coarse grained, subangular; 15% sand, fine grained; wet, mild odor.	77.0	▼
								CLAY WITH SILT: yellowish brown (10 YR 6/7); 80% clay; 20% silt; very stiff, moist, mild chlorinated odor.	78.5	
2.9/0.7		48			80	CL		UV = small grains - short wave.		
2.9/2.9		60			85				85.0	
								UV = Small grains - short wave.		
								Total depth is 85 feet below ground surface (bgs). Groundwater was encountered at 77 feet bgs.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-37240-T2.OSS.FIELD	BORING/WELL NUMBER	GP-2
PROJECT NAME	Omega Chemical	DATE DRILLED	10/27/03
LOCATION	12504 East Whittier Blvd., Whittier CA	CASING TYPE/DIAMETER	NA
DRILLING METHOD	Direct Push	SCREEN TYPE/SLOT	NA
SAMPLING METHOD	Macrocore	GRAVEL PACK TYPE	NA
GROUND SURFACE ELEVATION (FT MSL)	NA	GROUT TYPE/QUANTITY	Hydrated Bentonite Chips
TOP OF CASING ELEVATION (FT MSL)	NA	STATIC WATER LEVEL (FT BELOW TOC)	78.50
LOGGED BY	R. Douglas	GROUND WATER ELEVATION (FT MSL)	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								Concrete thickness is 6 inches.	0.5	
					5	ML		CLAYEY SILT: very dark greyish brown (10 YR 3/2); 100% clayey silt; low plasticity, slightly cohesive, dry to moist, no odor.		No well was constructed.
								CLAYEY SILT: dark yellowish brown (10 YR 4/4); 100% clayey silt; slightly plastic, slightly cohesive, dry to moist, no odor.	8.0	
								White Rock	8.5	
						SM		SILTY SAND WITH GRAVEL: yellowish brown (10 YR 5/4); 60% fragments; 20% silt; 20% gravel, white fragments, maximum diameter to 1 inch.	9.0	
5.8/0.7		48			10	ML		CLAYEY SILT: dark yellowish brown (10 YR 4/4); 100% clayey silt; moderate plasticity, slightly cohesive, dry to moist, no odor. UV = Numerous grains - short wave.		
5.0/0.7		54			15			UV = Numerous grains - short wave.		
						CL		CLAY WITH SILT: brown (10 YR 3/3); 75% clay; 25% silt; moderate plasticity, laminations, moist, no odor.	16.0	
2.9/0.7		60			20					

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-2

PROJECT NAME Omega Chemical **DATE DRILLED** 10/27/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								UV = Isolated grains - short wave.	21.0	
						ML		SILT WITH CLAY: dark brown (10 YR 3/3); 60% silt; 30% clay; 10% sand, fine to coarse grained; trace gravel; dry to moist, no odor.	24.0	
5.8/2.0		60			25	CL		CLAY WITH SILT: brown (10 YR 3/3); 75% clay; 25% silt; moderate plasticity, laminations, damp, no odor. UV = Isolated grains - short wave.		
8.7/2.9		60			30			UV = Isolated grains - short wave.	31.5	
						CL		CLAY WITH SAND AND GRAVEL: brown (10 YR 4/3); 60% clay; 20% sand, coarse grained; 20% gravel, fragmented, maximum diameter is 1.5 inches; moist.	32.0	
						ML		SILT WITH CLAY: brown (10 YR 4/3); 65% silt; 25% clay; 10% sand, fragements; moderate plasticity, moist to wet, no odor.	35.0	
5.8/0.0		60			35	CL		CLAY WITH SILT: brown (10 YR 3/3); 75% clay; 25% silt; moderate plasticity, laminations, moist, slight odor. UV = Isolated specks - short wave. CLAY WITH SILT: brown (10 YR 3/3); 75% clay; 25% silt; moderate plasticity, laminations, moist, no odor.		
5.8/0.0		60			40			UV = Few grains - short wave.	41.5	
						CL		GRAVELLY CLAY: brown (10 YR 4/3); 70% clay; 30% gravel, subangular to angular, diameter to 1 inch, fragmented; moist, no odor.	42.0	
								SILT WITH CLAY: brown (10 YR 4/3); 50% silt; 40% clay;		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-2
PROJECT NAME Omega Chemical **DATE DRILLED** 10/27/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						ML		10% sand, fragements; moderate plasticity, moist, no odor.		
8.7/2.9		60			45				45.0	
								CLAY WITH SILT: brown (10 YR 3/3); 75% clay; 25% silt; moderate plasticity, laminations, moist, no odor.		
								UV = Numerous streaks and specks - short and long wave.		
14.5/ 0.0		60			50			UV = Streaks and grains - short wave.		
5.8/0.0					55			UV= Streaks - short wave.		
								CLAY WITH SILT: brown (10 YR 3/3); 75% clay; 25% silt; moderate plasticity, laminations, moist, slight odor.		
2.9/0.0					60			UV = Isolated grains - short wave.		
						CL		CLAY WITH SILT: brown (10 YR 3/3); 75% clay; 25% silt; moderate plasticity, laminations, moist, no odor.		
66.1/ 0.0		60			65			UV = Isolated grains - short wave.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-2
PROJECT NAME Omega Chemical **DATE DRILLED** 10/27/03

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								CLAY WITH SILT: brown (10 YR 3/3); 75% clay; 25% silt; moderate plasticity, laminations, moist, slight odor.		
30.6/ 0.0		60			70			CLAY WITH SILT: brown (10 YR 3/3); 70% clay; 20% silt; 10% fragments; moderate plasticity, laminations, moist, no odor.		
								UV = Isolated grains - short wave.		
								CLAY WITH SILT: brown (10 YR 3/3); 85% clay; 15% silt; trace of gravel; very stiff, moderate plasticity, laminations, moist, moderate chlorinated hydrocarbon odor.		
0.0/0.0		36			75			UV = Isolated grains and streaks - short wave.		
10.2/ 0.0								CLAY WITH SILT: brown (10 YR 3/3); 85% clay; 15% silt; trace of gravel; very stiff, moderate plasticity, laminations, moist, strong chlorinated hydrocarbon odor.		
								UV = Abundant specks and streaks - short wave.	78.5	▼
0.0/0.0						CL		CLAY WITH SAND: brown (10 YR 4/3); 70% clay; 20% sand, very fine to coarse grained, subround to subangular, poorly graded; 10% silt; trace gravel, fine grained; wet, slight odor.	79.5	
0.0/0.0		60			80	CL		CLAY WITH SILT: brown (10 YR 3/3); 85% clay; 15% silt; trace of gravel; very stiff, moderate plasticity, laminations, moist, no odor.		
								UV = Isolated grains - short wave.		
0.0/0.0		60			85				85.0	
								UV = Grains - short wave.		
								Total depth is 85 feet below ground surface (bgs). Groundwater was encountered at 78.5 feet bgs.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-37240-T2.OSS.FIELD	**BORING/WELL NUMBER**	GP-3
PROJECT NAME	Omega Chemical	**DATE DRILLED**	10/28/03
LOCATION	12504 East Whittier Blvd., Whittier CA	**CASING TYPE/DIAMETER**	NA
DRILLING METHOD	Direct Push	**SCREEN TYPE/SLOT**	NA
SAMPLING METHOD	Macrocore	**GRAVEL PACK TYPE**	NA
GROUND SURFACE ELEVATION (FT MSL)	NA	**GROUT TYPE/QUANTITY**	Hydrated Bentonite Chips
TOP OF CASING ELEVATION (FT MSL)	NA	**STATIC WATER LEVEL (FT BELOW TOC)**	NA
LOGGED BY	R. Douglas	**GROUND WATER ELEVATION (FT MSL)**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	DEPTH (ft. bgs)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						Concrete is 10 inches thick.	0.8	
		36			GP	GRAVEL: light grayish green (10 Y 8/1); 90% gravel, medium to coarse grained, angular, poorly graded; 10% silt in matrix; dry.		
		0		5			7.0	No well was constructed.
10.2		42		10	CL	CLAY: brown (10 YR 4/3); 100% clay; moderate plasticity, soft, moist, slight odor.		
						CLAY: brown (10 YR 4/3); 100% clay; moderate plasticity, medium stiffness, moist, moderate odor.		
5.1		60		15			17.0	
		0			GP	GRAVEL: light grayish green (10 Y 8/1); 90% gravel, medium to coarse grained, angular, poorly graded; 10% silt in matrix; dry.	18.0	
					CL	CLAY: brown (10 YR 4/3); 100% clay; moderate plasticity, medium stiffness, moist, moderate odor.	18.5	
				20	GP	GRAVEL: light grayish green (10 Y 8/1); 90% gravel, medium to coarse grained, angular, poorly graded; 10% silt in matrix; dry.	20.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-3
PROJECT NAME Omega Chemical **DATE DRILLED** 10/28/03

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
		36				CL		CLAY: brown (10 YR 4/3); 100% clay; moderate plasticity, medium stiffness, moist, moderate odor.		
					25					
					30					
					35				35.0	
								Total Depth is 35 feet below ground surface. Groundwater was not encountered.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-37240-T2.OSS.FIELD	**BORING/WELL NUMBER**	GP-3A
PROJECT NAME	Omega Chemical	**DATE DRILLED**	10/28/03
LOCATION	12504 East Whittier Blvd., Whittier CA	**CASING TYPE/DIAMETER**	NA
DRILLING METHOD	Direct Push	**SCREEN TYPE/SLOT**	NA
SAMPLING METHOD	Macrocore	**GRAVEL PACK TYPE**	NA
GROUND SURFACE ELEVATION (FT MSL)	NA	**GROUT TYPE/QUANTITY**	Hydrated Bentonite Chips
TOP OF CASING ELEVATION (FT MSL)	NA	**STATIC WATER LEVEL (FT BELOW TOC)**	83.00
LOGGED BY	R. Douglas	**GROUND WATER ELEVATION (FT MSL)**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								Concrete thickness is 6 inches.	0.5	No well was constructed.
						CL		CLAY: brown (10 YR 4/3); 100% clay; soft, moist, no odor.		
					5			CLAY: brown (10 YR 4/3); 100% clay; soft, moist, slight odor.		
								CLAY: brown (10 YR 4/3); 100% clay; soft, moist, no odor.	8.0	
						CL		CLAY AND GRAVEL: brown (10 YR 4/3); 60% clay; 40% gravel, angular, maximum diameter is 1 inch; soft, moist, no odor.	8.5	
20.4/ 0.0		48			10			CLAY: brown (10 YR 4/3); 100% clay; soft, moist, no odor. UV = Abundant streaks and grains - short wave, some grains - long wave.		
10.2/ 0.0		48			15			UV = Isolated grains - short wave.		
								CLAY: brown (10 YR 4/3); 100% clay; medium stiff, moist, slight odor.		
15.3/		60			20	CL				

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-3A
PROJECT NAME Omega Chemical **DATE DRILLED** 10/28/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.0								UV = Isolated grains - short wave.		
10.2/ 0.0		60			25			UV = Isolated grains - short wave.		
10.2/ 0.0		60			30			UV = No grains or streaks observed.	30.5	
						ML		SILT: brown (10 YR 4/3); 80% silt; 10% clay; 10% sand, very fine grained; very soft, moist to wet, no odor.	32.0	
								CLAY: brown (10 YR 4/3); 100% clay; stiff, moist, no odor.		
10.2/ 0.0		30								
10.2/ 0.0		30			35			UV = No grains or streaks observed.		
						CL				
25.5/ 0.0		24			40			UV = Isolated grains - short wave.		
10.2/ 0.0		36							42.0	
						ML		SILT: brown (10 YR 4/3); 80% silt; 10% clay; 10% sand, very fine grained; very soft, moist to wet, no odor.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-3A
PROJECT NAME Omega Chemical **DATE DRILLED** 10/28/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						CL		CLAY: brown (10 YR 4/3); 100% clay; stiff, moist, no odor.	43.0	
						ML		SILT: brown (10 YR 4/3); 80% silt; 10% clay; 10% sand, very fine grained; very soft, moist to wet, moderate odor.	44.0	
40.8/ 0.0		60			45	CL		CLAY: brown (10 YR 4/3); 100% clay; very stiff, moist, moderate odor. UV = Isolated grains.	45.0	
10.2/ 0.0		54			50	CL		UV = Isolated grains - short wave.		
15.3/ 0.0		60			55			UV = Isolated grains and streaks.		
30.6/ 0.0		60				ML		SILT: brown (10 YR 4/3); 80% silt; 10% clay; 10% sand, very fine grained; very soft, moist to wet, slight to moderate odor.	57.0	
						CL		CLAY: brown (10 YR 4/3); 100% clay; stiff, moist, moderate odor.	58.0	
10.2/ 0.0		36			60			UV = Abundant grains and streaks - short wave.		
						ML		SILT: brown (10 YR 4/3); 80% silt; 10% clay; 10% sand, very fine grained; very soft, moist to wet, moderate odor.	61.0	
35.7/ 0.0		30				CL		CLAY: brown (10 YR 4/3); 100% clay; stiff, moist, moderate odor.	62.0	
								SILT WITH CLAY: brown (10 YR 4/3); 70% silt; 30% clay; soft, moist to wet, moderate to strong odor.	64.0	
51/ 0.0		30			65			UV = Abundant grains and streaks - short wave.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-3A
PROJECT NAME Omega Chemical **DATE DRILLED** 10/28/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						ML				
35.7/ 0.0		24						SILT WITH CLAY: brown (10 YR 4/3); 70% silt; 30% clay; soft, moist to wet, strong odor.		
20.4/ 0.0		12			70			SILT WITH CLAY: brown (10 YR 4/3); 70% silt; 25% clay; 5% fragments; soft, moist to wet, moderate to strong odor.	70.0	
						CL		CLAY: brown (10 YR 4/3); 100% clay; stiff, moist, moderate odor. UV = Some grains and streaks - short wave.		
10.2/ 0.0		36			75			CLAY: brown (10 YR 4/3); 100% clay; stiff, moist, very strong odor. CLAY: brown (10 YR 4/3); 100% clay; stiff, moist, moderate odor. UV = Abundant specks and streaks.		
10.2/ 0.0		24							78.0	
						CL		CLAY WITH SAND: brown (10 YR 4/3); 60% clay; 30% sand, fine grained; 10% silt; moist.	79.0	
						CL		CLAY: brown (10 YR 4/3); 100% clay; stiff, moist, moderate odor.	80.0	
5.0/ 0.0		12			80	ML		SILT WITH CLAY: brown (10 YR 4/3); 70% silt; 30% clay; soft, moist to wet, moderate to strong odor. UV = Abundant streaks - short wave.	81.0	
401/ 0.0		12				CL		CLAY: brown (10 YR 4/3); 100% clay; stiff, moist, very strong odor.	83.0	▼
15.3/ 0.0		24				CL		CLAY WITH SAND: brown (10 YR 4/3); 60% clay; 20% sand, fine grained, subround to round; 10% gravel, fine grained, subround to round, maximum diameter is 0.5 inches; 10% silt; moist.	84.0	
5.1/ 0.0		24			85	CL		CLAY: brown (10 YR 4/3); 100% clay; stiff, moist, moderate odor. UV = Abundant grains and streaks.	85.0	

Total depth is 85 feet below ground surface (bgs).
Groundwater was encountered at 83 feet bgs.

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD
BORING/WELL NUMBER GP-4
PROJECT NAME Omega Chemical
DATE DRILLED 1/21/04 - 1/22/04
LOCATION Omega Chemical (C&I Electric)
CASING TYPE/DIAMETER NA
DRILLING METHOD Direct Push
SCREEN TYPE/SLOT NA
SAMPLING METHOD Macrocore
GRAVEL PACK TYPE NA
GROUND SURFACE ELEVATION (FT MSL)
GROUT TYPE/QUANTITY Hydrated Bentonite Chips
TOP OF CASING ELEVATION (FT MSL)
STATIC WATER LEVEL (FT BELOW TOC)
LOGGED BY Rosalind Douglas & Mike Hoffman
GROUND WATER ELEVATION (FT MSL)
REMARKS Well was sampled for lithology continously in 5-foot sections.

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	DEPTH (ft. bgs)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
		54				ASPHALT is 3 inches thick.	0.3	
					CL	CLAY: very dark grayish brown (10YR 3/2); 90% clay; 5% sand, poorly graded, coarse; 5% gravel, poorly graded, fine, angular to subrounded; moist, petroleum odor. Sand and gravel decrease with depth.		
7.1/ 1.6		42		5		Color change to brown (10YR 4/3), no sand or gravel.		
						Color change to dark yellowish brown (10YR 4/4) with white mottling, solvent odor.		
		60		10		5% fine sand.	11.0	
					SC	CLAYEY SAND: dark yellowish brown (10YR 4/4); 70% sand, poorly graded, fin; 30% clay; moist, solvent odor. Gravel in first 3 inches, fine to coarse, 1.5-inch maximum diameter, subrounded to rounded.	11.5	
5.7/ 1.6		60		15	CL	CLAY: dark brown (10YR 3/3); 100% clay, medium plasticity; trace fine sand; trace fine gravel, 1/2-inch diameter; moist, hard, solvent odor.		
				20	GP		20.0	
4.4/ 1.6		48	OC-SB-GP6-2[illegible] 01220[illegible]			GRAVEL: 1.5-inch maximum diameter, subrounded to rounded.	20.2	
					CL	No longer any sand or gravel.		
6.4/ 1.6		60		25				
					SW		29.5	
13.9/ 1.6		12		30		SAND WITH GRAVEL: yellowish brown (10YR 5/4); 80% sand, well graded, fine to coarse; 20% gravel, poorly graded, fine, 1/2-inch maximum diameter, angular to subangular; moist, solvent odor.	29.8	
					CL	CLAY: dark brown (10YR 3/3); 100% clay, medium plasticity, moist, solvent odor.		
				35			35.0	

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NEWGINT OMEGA NEWGINT.GDT 2/18/04

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-4
PROJECT NAME Omega Chemical **DATE DRILLED** 1/21/04 - 1/22/04

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
3.0/ 0.6		60	OC-SB-GP6-3[illegible]-01220[illegible]					CLAY: dark brown (10YR 3/3); 100% clay, medium plasticity, moist, solvent odor.		
10/ 0.6		18			40	CL				
2.3/		30	OC-SB-GP6-4[illegible]-01220[illegible]		45					
						CL		CLAY: dark brown (10YR 3/3); 60% clay, 40% silt; low plasticity; trace sand; moist, solvent odor is getting stronger with depth.	49.0	
2.3/ 0.0		60			50				50.0	
5.7/ 0.6		24			55					
19/ 0.6		30			60	CL				
35.6/ 0.6		18	OC-SB-GP6-6[illegible]-01220[illegible]		65					
10.2		60			70			Veins of white mineral present.		
					75			Trace fine (1/2-inch maximum), angular gravel from 73.5 to 74 feet bgs.	75.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-4
PROJECT NAME Omega Chemical **DATE DRILLED** 1/21/04 - 1/22/04

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
4.3		32						CLAY: dark brown (10YR 3/3); 100% clay, medium plasticity, moist, solvent odor.		
		30			80	CL				
					85			Total depth of borehole is 85 feet bgs.	85.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD
BORING/WELL NUMBER GP-5
PROJECT NAME Omega Chemical
DATE DRILLED 1/20/04
LOCATION Omega Chemical (C&I Electric)
CASING TYPE/DIAMETER NA
DRILLING METHOD Direct Push
SCREEN TYPE/SLOT NA
SAMPLING METHOD Macrocore
GRAVEL PACK TYPE NA
GROUND SURFACE ELEVATION (FT MSL)
GROUT TYPE/QUANTITY Hydrated Bentonite Chips
TOP OF CASING ELEVATION (FT MSL)
STATIC WATER LEVEL (FT BELOW TOC)
LOGGED BY R. Douglas
GROUND WATER ELEVATION (FT MSL)
REMARKS Well was sampled for lithology continously in 5-foot sections.

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
		42						ASPHALT is 4 inches thick.	0.3	
						ML		SILT WITH SAND (FILL): very dark grayish brown (10YR 2/2) and yellowish brown (10YR 5/4); 70% silt, 15% sand, fine to coarse; 15% gravel and fragments, poorly graded, fine, 1/2-inch maximum diameter, angular; hard, dry.	2.5	
						ML		SILT: very dark grayish brown (10YR 2/2); 80% silt, 20% clay, nonplastic to low plasticity, dry, hard, slight odor.		
5.0		42			5			Color change to dark yellowish brown (10YR 4/4).		
3.7		42			10				12.0	
						SM		SILTY SAND: yellowish brown (10YR 5/4); 85% sand, poorly graded, fine; 15% silt; moist, solvent odor.	14.0	
						SP		SAND WITH GRAVEL: yellowish brown (10YR 5/4); 80% sand, well graded, fine to coarse; 20% gravel and fragments, fine to coarse, 1-inch maximum diameter, subrounded to rounded; dry, solvent odor.	14.5	
9.8		60	OC-SB-GP6-1 01200		15	CL		CLAY: dark brown (10YR 3/3); 100% clay, low to medium plasticity; moist, strong solvent odor.		
9.1		60			20					
7.8		60			25			Some gravel from 27 to 28 ft bgs, fine to coarse, 1-inch maximum diameter, subrounded.		
36		60	OC-SB-GP6-3 01200		30					
					35				35.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-5
PROJECT NAME Omega Chemical **DATE DRILLED** 1/20/04

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
22.1/ 0.3		60				CL		CLAY: dark brown (10YR 3/3); 100% clay, low to medium plasticity; moist, strong solvent odor.		
								Color change to dark yellowish brown (10YR 3/4).		
5.7/ 0.3		30			40					
5.0/ 0.3		48			45					
9.8/ 0.3		24	OC-SB GP6-5 01200		50					
5.7/ 0.6		24			55			Color change to dark yellowish brown (10YR 4/4) with mottling.		
						ML		SILT WITH GRAVEL: dark yellowish brown (10YR 4/4) with mottling; 80% silt; 20% gravel, fine to coarse, 1-inch maximum diameter, subrounded to rounded moist, strong solvent odor.	58.0	
19/ 0.6		30			60	CL		CLAY: strongly mottled, dark yellowish brown (10YR 3/4) and dark grayish brown (2.5Y 4/2); 100% clay, low to medium plasticity; trace coarse sand and fine gravel, rounded; moist, strong solvent odor.	59.0	
24.1/ 0.3		24	OC-SB GP6-6 01200		65					
						SP		SAND: yellowish brown (10YR 5/6); 100% sand, poorly graded, fine, moist, solvent odor.	68.0	
11.8/ 0.3		42	OC-SB GP6-573-01200 (Dup)		70	CL		CLAY: brown (7.5Y 4/4); 100% clay, low plasticity, moist, solvent odor.	68.5	
						ML		SILT WITH SAND: dark yellowish brown (10YR 4/4); 60% silt, 20% sand, fine to medium, trace coarse; 20% gravel, fine to coarse, 1-inch maximum diameter, rounded; moist,	73.0	
					75				74.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-5
PROJECT NAME Omega Chemical **DATE DRILLED** 1/20/04

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
9.8/ 0.3		36						solvent odor.		
						CL		CLAY: brown (10YR 4/3); 100% clay, low plasticity, hard, moist, solvent odor.		
					80					
23.4/ 0.3		36								
						CL		CLAY WITH GRAVEL: brown (10YR 4/3); 70% clay, low to medium plasticity; 20% gravel, poorly graded, fine, 1/2-inch maximum diameter, subrounded to rounded; 10% fine sand; moist, solvent odor.	83.0	∇
					85			Total depth of borehole is 85 feet bgs.	85.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-37240-T2.OSS.FIELD	BORING/WELL NUMBER	GP-6
PROJECT NAME	Omega Chemical	DATE DRILLED	1/22/04
LOCATION	Omega Chemical (C&I Electric)	CASING TYPE/DIAMETER	NA
DRILLING METHOD	Direct Push	SCREEN TYPE/SLOT	NA
SAMPLING METHOD	Macrocore	GRAVEL PACK TYPE	NA
GROUND SURFACE ELEVATION (FT MSL)		GROUT TYPE/QUANTITY	Hydrated Bentonite Chips
TOP OF CASING ELEVATION (FT MSL)		STATIC WATER LEVEL (FT BELOW TOC)	
LOGGED BY	Mike Hoffman	GROUND WATER ELEVATION (FT MSL)	

REMARKS Well was sampled for lithology continously in 5-foot sections.

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
1.0		48						ASPHALT is 4 inches thick.	0.3	
						ML		SILT: black (10YR 2/1); 100% silt, nonplastic, horizontal partings, moist, hard.		
0.6		60			5			Color change to dark yellowish brown (10YR 4/4).		
0.4		60	OC-SB-GP6-1-01220 (Phys)		10					
1.2		60			15	CL		CLAY: dark yellowish brown (10YR 4/4); 100% clay, medium plasticity, moist, hard.	15.0	
								Color change to dark yellowish brown (10YR 3/4).		
1.1		42	OC-SB-GP6-2-01220 (Chem		20			Color change back to dark yellowish brown (10YR 4/4).		
1.2		18	OC-SB-GP6-3-01220 (Phys)		25					
5.5		30			30					
					35	SC			34.5	
									35.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-6
PROJECT NAME Omega Chemical **DATE DRILLED** 1/22/04

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
6.2		60				CL		CLAYEY SAND: dark yellowish brown (10YR 4/4); 80% sand, poorly graded, fine to medium, subangular to subrounded; 20% clay, nonplastic; moist. CLAY: dark yellowish brown (10YR 4/4); 100% clay, medium plasticity, moist, hard.		
7.1		24	OC-SB GP6-4 01220 (Phys)		40	CL		SANDY CLAY: dark yellowish brown (10YR 4/4); 70% clay, medium plasticity; 30% sand, poorly graded, fine, subangular to subrounded; moist, hard. CLAY: dark yellowish brown (10YR 4/4); 100% clay, medium plasticity, moist, hard.	40.0 40.5	
5.6		24	OC-SB GP6-5 01220 (Chem)		45			Color change to dark yellowish brown (10YR 3/4).		
11.2		30			50	CL				
25.8		24	OC-SB GP6-6 01220 (Phys)		55					
						CL		CLAY WITH GRAVEL: dark yellowish brown (10YR 3/4); 80% clay, medium plasticity; 20% gravel, poorly graded, fine, 3/4-inch maximum diameter, angular to subangular; moist, hard.	58.0 59.0	
38.8		30			60	CL		CLAY: dark yellowish brown (10YR 3/4); 100% clay, medium plasticity, moist, hard.		
						ML		SILT: dark yellowish brown (10YR 3/4); 100% silt, medium plasticity, moist, hard.	63.0 64.0	
46.7		30	OC-SB GP6-7 01220 (Chem)		65	CL		CLAY: dark yellowish brown (10YR 3/4); 100% clay, medium plasticity; trace gravel, poorly graded, fine, 1/4-inch maximum diameter, angular to subrounded; moist, hard.		
		36			70					
					75				75.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T2.OSS.FIELD **BORING/WELL NUMBER** GP-6
PROJECT NAME Omega Chemical **DATE DRILLED** 1/22/04

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
634		24	OC-SB-GP6-8 01220 (Phys)					CLAY: dark yellowish brown (10YR 3/4); 100% clay, medium plasticity; trace gravel, poorly graded, fine, 1/4-inch maximum diameter, angular to subrounded; moist, hard.		
					80	CL				
28.4		48								
					85				85.0	
								Total depth of borehole is 85 feet bgs.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.PHASE1A
BORING/WELL NUMBER GP-7
PROJECT NAME Omega Chemical
DATE DRILLED 1/21/04
LOCATION Terra Pave
CASING TYPE/DIAMETER NA
DRILLING METHOD Direct Push
SCREEN TYPE/SLOT NA
SAMPLING METHOD Macrocore
GRAVEL PACK TYPE NA
GROUND SURFACE ELEVATION (FT MSL)
GROUT TYPE/QUANTITY Hydrated Bentonite Chips
TOP OF CASING ELEVATION (FT MSL)
STATIC WATER LEVEL (FT BELOW TOC)
LOGGED BY Mike Hoffman
GROUND WATER ELEVATION (FT MSL)
REMARKS Well was sampled for lithology continously in 5-foot sections.

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
20.4		30						ASPHALT is 3 inches thick.	0.3	
						ML		SILT WITH SAND: very dark brown (10YR 2/2); 85% silt, nonplastic; 15% sand, poorly graded, fine, subangular to subrounded; horizontal partings, moist, hard.		
3.4		36			5			Color change to dark yellowish brown (10YR 4/4).		
2.3		42			10				11.5	
						SP		SAND: dark yellowish brown (10YR 4/4); 90% sand, poorly graded, fine to medium, trace coarse, subangular to subrounded; 10% gravel, poorly graded, fine, 3/4-inch maximum diameter, angular to subangular; trace silt; moist.	13.0	
1.6		60			15	ML		SILT WITH SAND: dark yellowish brown (10YR 4/4); 85% silt, nonplastic; 15% sand, poorly graded, fine, subangular to subrounded; horizontal partings, moist, hard.	17.0	
						SP		SAND WITH GRAVEL: dark yellowish brown (10YR 4/4); 80% sand, poorly graded, fine to medium, trace coarse, subangular to subrounded; 20% gravel, poorly graded, fine, 3/4-inch maximum diameter, angular to subangular; trace silt; moist.	17.5	
						ML		SILT WITH GRAVEL: dark yellowish brown (10YR 4/4); 85% silt, nonplastic; 15% gravel, poorly graded, fine, 1/2-inch maximum diameter, angular to rounded; horizontal partings, moist, hard.	20.0	
2.0		60			20	CL		CLAY: dark yellowish brown (10YR 4/4); 100% clay, nonplastic, moist, hard.	21.0	
						SP		SAND WITH GRAVEL: dark yellowish brown (10YR 4/4); 80% sand, poorly graded, fine to medium, trace coarse, subangular to subrounded; 20% gravel, poorly graded, fine, 3/4-inch maximum diameter, angular to subangular; trace silt; moist.	21.5	
3.3		60			25	CL		CLAY: dark yellowish brown (10YR 4/4); 100% clay, nonplastic, moist, hard.		
1.7		36			30					
					35				35.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.PHASE1A **BORING/WELL NUMBER** GP-7
PROJECT NAME Omega Chemical **DATE DRILLED** 1/21/04

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
6.6		60				CL		CLAY: dark yellowish brown (10YR 4/4); 100% clay, nonplastic, moist, hard.		
10.0		18			40					
12.7		36	OC-SB-GP7-4 01210		45					
19.0		60			50					
1.5		24			55				57.0	
						SP		SAND: dark yellowish brown (10YR 4/4); 90% sand, poorly graded, fine to medium, trace coarse, subangular to subrounded; 10% gravel, poorly graded, fine, 3/4-inch maximum diameter, angular to subangular; trace silt; moist.	60.0	
122		24	OC-SB-GP7-6 01210		60	CL		CLAY: dark yellowish brown (10YR 4/4); 100% clay, nonplastic, moist, hard.		
57.8		18	OC-SB-GP7-6 01210		65					
32.6		30			70					
					75				75.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.PHASE1A **BORING/WELL NUMBER** GP-7
PROJECT NAME Omega Chemical **DATE DRILLED** 1/21/04

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
12.1		24						CLAY: dark yellowish brown (10YR 4/4); 100% clay, nonplastic, moist, hard.		
9.7		36			80	CL				
					85			Total depth of borehole is 85 feet bgs.	85.0	

NEWGINT OMEGA.GPJ NEWGINT.GDT 2/18/04

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-37240-T1.GW.PHASE1A	**BORING/WELL NUMBER**	GP-8
PROJECT NAME	Omega Chemical	**DATE DRILLED**	1/21/04
LOCATION	Terra Pave	**CASING TYPE/DIAMETER**	NA
DRILLING METHOD	Direct Push	**SCREEN TYPE/SLOT**	NA
SAMPLING METHOD	Macrocore	**GRAVEL PACK TYPE**	NA
GROUND SURFACE ELEVATION (FT MSL)		**GROUT TYPE/QUANTITY**	Hydrated Bentonite Chips
TOP OF CASING ELEVATION (FT MSL)		**STATIC WATER LEVEL (FT BELOW TOC)**	
LOGGED BY	Mike Hoffman	**GROUND WATER ELEVATION (FT MSL)**	

REMARKS Well was sampled for lithology continously in 5-foot sections.

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.0		36						ASPHALT is 3 inches thick.	0.3	
						ML		SILT WITH SAND: dark yellowish brown (10YR 4/4); 85% silt, nonplastic; 15% sand, poorly graded, fine, subangular to subrounded; horizontal partings, moist, hard.		
0.8		48			5			Color change to very dark brown (10YR 2/2).	10.0	
1.3		30			10	SP		SAND WITH GRAVEL: light yellowish brown (10YR 6/4); 85% sand, poorly graded, fine to medium, trace coarse, subangular to subrounded; 15% gravel, poorly graded, fine, 1/2-inch maximum diameter, angular to subangular; moist.	11.5	
						ML		SILT WITH SAND: very dark brown (10YR 2/2); 85% silt, nonplastic; 15% sand, poorly graded, fine, subangular to subrounded; horizontal partings, moist, hard.	15.0	
1.3		60			15	SP		SAND WITH GRAVEL: light yellowish brown (10YR 6/4); 85% sand, poorly graded, fine to medium, trace coarse, subangular to subrounded; 15% gravel, poorly graded, fine, 1/2-inch maximum diameter, angular to subangular; moist.	18.0	
						CL		CLAY: dark yellowish brown (10YR 4/4); 100% clay, nonplastic, moist, hard.		
2.2		30			20					
7.5		60			25					
2.1		60			30					
					35				35.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1 GW.PHASE1A **BORING/WELL NUMBER** GP-8
PROJECT NAME Omega Chemical **DATE DRILLED** 1/21/04

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
11.6		60				CL		CLAY: dark yellowish brown (10YR 4/4); 100% clay, nonplastic, moist, hard.		
5.3		24			40					
2.6		48			45					
46.5		60	OC-SB-GP8-5[illegible]-012104		50					
2.7		12	OC-SB-GP8-6[illegible]-012104		55					
0.7		18			60	SP		SAND: brown (10YR 4/3); 100% sand, poorly graded, fine, subangular to subrounded; moist.	60.0	
12.5		12	OC-SB-GP7-6[illegible]-012104		65			Hit refusal, total depth of borehole is 66 feet bgs.	66.0	

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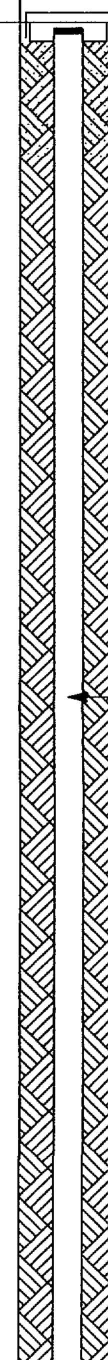
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a
BORING/WELL NUMBER B-1/PZ-1
PROJECT NAME Omega Chemical
DATE DRILLED 11/5/03
LOCATION 12511 Putnam St, Whittier, CA
CASING TYPE/DIAMETER 2" Diameter Sch 40 PVC
DRILLING METHOD Sonic
SCREEN TYPE/SLOT 2" Diameter Sch 40 PVC / 0.020"
SAMPLING METHOD Continuous Core
GRAVEL PACK TYPE Lapis Lustre #2/12
GROUND SURFACE ELEVATION (FT MSL) NA
GROUT TYPE/QUANTITY Portland Cement / 5% Bentonite
TOP OF CASING ELEVATION (FT MSL) NA
STATIC WATER LEVEL (FT BELOW TOC) 67.40
LOGGED BY T. Titus
GROUND WATER ELEVATION (FT MSL)
REMARKS Well is on west side of Putnam St., north of Washington Blvd.

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
								Concrete is 7" thick	0.6
								Roadbase	1.0
								SILT: brown; 95% silt; 5% gravel, coarse grained, subround to round; trace of cobbles, round, maximum diameter of 1 inch; medium density, dry, no odor.	
		60			5				
0.0		60			10	ML			
								SILT WITH CLAY: reddish brown; 90% silt; 10% clay; trace of gravel, medium to coarse grained, round; non-plastic, high density, moist, no odor.	
4.0		60			15				
					20				20.0

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a **BORING/WELL NUMBER** B-1/PZ-1

PROJECT NAME Omega Chemical **DATE DRILLED** 11/5/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
6.0		60						SILT WITH CLAY: reddish brown; 80% silt; 20% clay; trace of gravel, medium to coarse grained, round; low plasticity, low density, moist, no odor.		
5.0		60			25			SILT WITH SAND: reddish brown; 80% silt; 20% sand, very fine to fine grained, round; trace gravel, medium to coarse grained, round; trace of cobbles, round, maximum diameter of 2 inch; low density, moist, no odor.		Portland Cement / 5% Bentonite Grout
								SILT WITH CLAY: reddish brown; 90% silt; 10% clay; trace of gravel, medium to coarse grained, subround; high density, moist, no odor.		
7.0		60			30			SILT WITH CLAY: reddish brown; 90% silt; 10% clay; trace of very fine to fine sand; non-plastic, medium density, moist, no odor.		
37		60			35					
44		60			40	ML		SILT WITH SAND: reddish brown; 80% silt; 20% sand, very fine to fine grained, round; trace of gravel, fine to medium grained, subround to subangular; medium to high density, dry, no odor.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a
BORING/WELL NUMBER B-1/PZ-1
PROJECT NAME Omega Chemical
DATE DRILLED 11/5/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						ML			43.0	
25		30			45					
						SM		SAND AND SILT: reddish brown; 50% sand, very fine to fine grained, round, poorly graded; 50% silt; low density, dry, no odor.	49.0	
34		60			50					
								SAND AND SILT WITH GRAVEL: tan; 60% sand, very fine to coarse grained, subround to round, well graded, 30% silt; 10% gravel, fine to coarse grained, subround to round; trace of cobbles, round, maxium 1 inch diameter; slightly cemented, low density, dry, no odor.		
12		60			55					
						ML		SILT WITH GRAVEL: reddish brown; 90% silt; 10% gravel, fine to coarse grained, subround; moderate density, dry, no odor.	55.5	
						SM		SAND AND SILT: tan; 50% sand, very fine to coarse grained, subround to round, well graded; 50% silt; dry, no odor.	56.0	
						SW		SAND: reddish brown; 95% sand, very fine to coarse grained, subround to round, well graded; 5% gravel, fine to medium grained, subround to round; slightly cemented, dry, no odor.	56.5	Uncoated Hydrated Bentonite Chips
20		48								
						SP		SAND WITH SILT: reddish brown; 90% sand, very fine to fine grained, round, poorly graded, 10% silt; slightly cemented, dry, no odor.	59.5	
					60					
8.0		36								
								SAND: reddish brown; 100% sand, fine to medim grained, round, poorly graded, dry, no odor.		
11		36			65					

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1 GW Phase1a **BORING/WELL NUMBER** B-1/PZ-1

PROJECT NAME Omega Chemical **DATE DRILLED** 11/5/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
8.0		24				SM		SAND WITH SILT: tan; 70% sand, very fine to fine grained, round, poorly graded; 30% silt; slightly cemented, dry, no odor.	66.0	
						CL		CLAY AND SILT: brown; 60% clay; 40% silt; high density, dry, no odor.	68.0	
						SW		SAND WITH SILT: reddish brown; 80% sand, very fine to coarse grained, subround, well graded; 20% silt; dry, no odor.	68.5	
						SM		SAND AND SILT: tan; 70% sand, very fine to fine, round, poorly graded; 30% silt; low density, dry, no odor.	69.0	
						SW		SAND WITH SILT: reddish brown; 80% sand, very fine to coarse grained, subround, well graded; 20% silt; dry, no odor.	69.5	
5.0		60			70	SM		SAND AND SILT: tan; 70% sand, very fine to fine, round, poorly graded; 30% silt; slightly cemented, dry, no odor.	70.0	#2/12 Lapis Lustre Sand
						ML		SAND AND SILT WITH CLAY; brown; 50% sand, medium to coarse grained, subround to round, well graded; 40% silt; 10% clay; trace of gravel, fine to coarse grained, subround to round; wet, no odor.	72.5	
						CL		SILT AND SAND: brown; 60% silt; 40% sand, fine to medium grained, subround, poorly graded; wet, no odor.	73.0	
9.0		48			75	ML		CLAY. brown; 100% clay; high plasticity, high density, moist, no odor. SILT WITH CLAY: brown; 90% silt; 10% clay, trace of gravel, fine to coarse grained, subround; high density, moist, no odor. SILT AND CLAY WITH SAND: orangish brown; 60% silt; 30% clay; 10% sand, very fine to fine grained, round; low plasticity, high density, moist, no odor. SILT WITH CLAY: orangish brown; 75% silt; 20% clay; 5% gravel, fine to coarse grained, subround to round; low plasticity, high density, moist, no odor.	74.0	2" Diameter, SCH 40 PVC, 0.020" Slotted Casing
37		72			80	SM		SAND AND SILT: orangish brown; 60% sand, very fine to fine grained, round, poorly graded; 40% silt; moist, no odor.	79.0	
						SW		SAND AND SILT WITH GRAVEL: orangish brown; 50% sand, fine to coarse grained, round to angular, well graded; 30% silt; 20% gravel, fine to coarse grained, round to anagular, well graded; wet, no odor.	84.0	
					85	SM		SAND AND SILT: orangish brown; 70% sand, very fine to fine grained, subround to round, poorly graded; 30% silt; wet, no odor.	84.5	
						SW		SAND WITH SILT AND GRAVEL: brown, 60% sand, fine to coarse grained, subround to round, well graded; 20% silt; 20% gravel, fine to coarse grained, subround to round, well graded; trace cobbles, maximum diameter of 2 inches; wet, no odor.	86.0	
								GRAVEL, SILT, AND SAND: brown; 40% gravel, fine to	87.5	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a **BORING/WELL NUMBER** B-1/PZ-1
PROJECT NAME Omega Chemical **DATE DRILLED** 11/5/03

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						GW GM		coarse grained, subangular to subround, well graded; 30% sand, medium to coarse grained, subround to subangular, well graded; 30% silt; trace of cobbles, maximum diameter of 3.5 inches; high density, dry, no odor.	90.0	
16		96			90			Total Depth is 90 feet below ground surface (bgs). Groundwater was encountered at 67.4 feet bgs.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-37240-T1.GW.Phase1a	**BORING/WELL NUMBER**	B-2/PZ-2
PROJECT NAME	Omega Chemical	**DATE DRILLED**	11/7/03
LOCATION	12511 Putnam St, Whittier, CA	**CASING TYPE/DIAMETER**	2" Diameter Sch 40 PVC
DRILLING METHOD	Sonic	**SCREEN TYPE/SLOT**	2" Diameter Sch 40 PVC / 0.020"
SAMPLING METHOD	Continuous Core	**GRAVEL PACK TYPE**	Lapis Lustre #2/12
GROUND SURFACE ELEVATION (FT MSL)	NA	**GROUT TYPE/QUANTITY**	Portland Cement / 5% Bentonite
TOP OF CASING ELEVATION (FT MSL)	NA	**STATIC WATER LEVEL (FT BELOW TOC)**	NM
LOGGED BY	T. Titus	**GROUND WATER ELEVATION (FT MSL)**	

REMARKS Well is on west side of Putnam St., north of Washington Blvd.

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								Concrete is 7" thick	0.6	
								Roadbase	1.0	
								SILT WITH SAND: reddish brown; 85% silt; 10% sand, very fine grained, rounded; 5% clay; medium density, moist, no odor.		
		60			5					
						ML				
11		60			10					2" Diameter, SCH 40 PVC, Blank Casing
								SILT AND SAND: reddish brown; 65% silt; 30% sand, very fine grained, round, poorly graded; 5% gravel, fine grained, round; medium density, moist, no odor.		
								SILT WITH SAND AND CLAY: reddish brown; 60% silt; 20% sand, very fine grained, round, poorly graded; 20% clay; low plasticity, medium density, moist, no odor.		
								SILT WITH CLAY: reddish brown; 90% silt; 10% clay; high density, moist, no odor.		
12		60			15					
						ML		SILT AND SAND WITH GRAVEL: reddish brown; 50% silt; 40% sand, very fine to coarse grained, subround to round, well graded; 10% gravel, fine to coarse grained, subround, well graded; trace of cobbles, subround to round, maxium diameter of 0.5 inches; medium density,	18.0	
					20				20.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a **BORING/WELL NUMBER** B-2/PZ-2
PROJECT NAME Omega Chemical **DATE DRILLED** 11/7/03

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
13		60						moist, no odor. SILT AND CLAY: reddish brown; 60% silt; 40% clay; moderate plasticity, high density, moist, no odor.		
								SILT WITH SAND AND CLAY: reddish brown; 60% silt; 20% sand, very fine grained, round, poorly graded; 20% clay; high density, moist, no odor.		
23		60			25					Portland Cement / 5% Bentonite Grout
						ML				
19		60			30			SILT AND SAND: reddish brown; 70% silt; 30% sand, very fine to fine grained, round, poorly graded; medium density, moist, no odor.		
								SILT WITH SAND: reddish brown; 90% silt; 10% sand, very fine grained, round, poorly graded; high density, moist, no odor.		
199		60			35					
						SM		SAND AND SILT: tan; 60% sand, very fine to fine grained, subround to round, poorly graded; 40% silt; moist, no odor.	37.5	
104		60			40			SILT WITH SAND AND CLAY: reddish brown; 80% silt; 10% sand, very fine grained, round, poorly graded; 10% clay; high density, moist, no odor.	40.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a **BORING/WELL NUMBER** B-2/PZ-2
PROJECT NAME Omega Chemical **DATE DRILLED** 11/7/03

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						ML				
55		30			45					
								SAND AND SILT: tan; 60% sand, very fine to fine grained, round, poorly graded; 40% silt; dry, no odor.	46.0	
						SM				
133		60			50					
								SAND WITH SILT: reddish brown; 80% sand, very fine to fine grained, round, poorly graded; 20% silt; moist, no odor.	52.0	
17		60			55					Uncoated Hydrated Bentonite Chips
10		60			60			SAND: light brown; 100% sand, very fine to fine grained, round, poorly graded; slightly cemented, dry, no odor.		
						SP				
20		48								
					65					

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a **BORING/WELL NUMBER** B-2/PZ-2

PROJECT NAME Omega Chemical **DATE DRILLED** 11/7/03

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	DEPTH (ft. bgs)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
8.0		36				SAND: olive; 100% sand, fine grained, subround to round, poorly graded; wet, no odor.		
						SAND: olive; 100% sand, fine to medium grained, subround to round, poorly graded; wet, no odor.		
30		36		70	CL	CLAY AND SILT: yellowish brown; 70% clay; 30% silt; high plasticity, high density, moist, no odor.	70.0	#2/12 Lapis Lustre Sand
								2" Diameter, SCH 40 PVC, 0.020" Slotted Casing
3.0		60		75				
					ML	SILT AND SAND WITH GRAVEL AND CLAY: yellowish brown; 50% silt; 30% sand, fine grained, subround to round; 10% gravel, fine to coarse grained, subround to round; 10% clay; medium density, moist, no odor	77.0	
0.0		60		80				
					SM	SAND WITH SILT, GRAVEL, AND CLAY: yellowish brown; 50% sand, fine to coarse grained, subround to round, well graded; 20% silt; 20% gravel, fine to coarse grained, subround to round, well graded; 10% clay; moist to wet, no odor.	81.0	
					GW GM	GRAVEL, SILT, AND SAND: brown; 40% gravel, fine to coarse grained, subround to round, well graded; 30% sand, fine to coarse grained, round to subround, well graded; 30% silt; trace of cobbles, maximum diameter of 6 inches; high density, moist, no odor.	82.0	
1.0		60		85		Total Depth is 85 feet below ground surface (bgs). Groundwater was encountered at approximately 68 feet bgs.	85.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a
PROJECT NAME Omega Chemical
LOCATION 12511 Putnam St, Whittier, CA
DRILLING METHOD Sonic
SAMPLING METHOD Continuous Core
GROUND SURFACE ELEVATION (FT MSL) NA
TOP OF CASING ELEVATION (FT MSL) NA
LOGGED BY T. Titus
REMARKS Well is on west side of Putnam St., north of Washington Blvd.

BORING/WELL NUMBER B-3
DATE DRILLED 11/4/03
CASING TYPE/DIAMETER NA
SCREEN TYPE/SLOT NA
GRAVEL PACK TYPE NA
GROUT TYPE/QUANTITY Portland Cement / 5% Bentonite
STATIC WATER LEVEL (FT BELOW TOC) NM
GROUND WATER ELEVATION (FT MSL)

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								Concrete is 7" thick	0.6	
								Roadbase	1.0	
								SILT WITH CLAY: reddish brown; 90% silt; 10% clay; dry, no odor.		
2.0		60			5					No Well Was Constructed
6.9		24						SILT AND CLAY: reddish brown; 70% silt; 30% clay; low plasticity, high density, dry, no odor.		
								SILT: reddish brown; 95% silt; 5% gravel, coarse grained, subangular; trace of cobbles, maximum 1 inch diameter; medium density, dry, no odor.		
14		36			10	ML		SILT AND CLAY: reddish brown; 70% silt; 30% clay; low plasticity, low density, moist, no odor.		
55		24								
								SILT AND CLAY: reddish brown; 70% silt; 30% clay; non-plastic, high density, dry, no odor.		
3.0		36			15			SILT: reddish brown; 95% silt; 5% clay; non-plastic, medium density, dry, no odor.		
3.0		24								
					20				20.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a **BORING/WELL NUMBER** B-3
PROJECT NAME Omega Chemical **DATE DRILLED** 11/4/03

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PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
22		36								
5.0		24						SILT WITH CLAY: reddish brown; 80% silt; 20% clay; low plasticity, low density, moist, no odor.		
9.0		36			25			SILT: reddish brown; 100% silt; high density, dry, no odor.		
6.0		24								
14		36			30					
						ML				
16		36								
14		24			35			SILT WITH CLAY: reddish brown; 80% silt; 20% clay; low plasticity, medium density, dry, no odor.		
19		24						SILT: brown; 100% silt; high density, dry, no odor.		
9.0		36			40			SILT WITH SAND: reddish brown; 80% silt; 20% sand, very fine to fine grained, round; low density, dry, no odor.		

Continued Next Page

CDM
18581 Teller Avenue, Suite 200
Irvine, CA 92612
(949) 752-5452
(949) 752-1307 (FAX)

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW Phase1a **BORING/WELL NUMBER** B-3
PROJECT NAME Omega Chemical **DATE DRILLED** 11/4/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
30		36						SILT WITH CLAY: dark brown: 90% silt; 10% clay, low plasticity, high density, dry, no odor.		
18		24			45	SM		SAND WITH SILT: orangish brown; 90% sand, fine grained, round, poorly graded; 10% silt, dry, no odor.	45.0	
								SAND: tan; 100% sand, very fine to fine grained, round, poorly graded, slightly cemented, dry, no odor.	48.0	
15		42			50	SP				
								SAND: tan; 95% sand, very fine to fine grained, round, poorly graded, 5% gravel, coarse grained, subround; dry, no odor.		
						SM		SAND AND SILT: tan; 50% sand, very fine grained, round, poorly graded; 50% silt; dry, no odor.	52.5	
16		48				SP		SAND: tan; 95% sand, very fine to fine grained, round, poorly graded; 5% gravel, coarse grained, subround; dry, no odor.	53.0	
					55	SW		SAND WITH GRAVEL: orangish brown; 90% sand, fine to coarse grained, subround to round, well graded; 10% gravel, fine to coarse grained, subround to round; dry, no odor.	54.5	
20		36				SP		SAND AND SILT: tan; 50% sand, very fine grained, round, poorly graded, 50% silt; slightly cemented, dry, no odor.	57.0	
						SM		SAND WITH GRAVEL AND SILT: brown; 80% sand, very fine to fine grained, round, poorly graded; 10% gravel, fine grained, subround to subangular; 10% silt; dry, no odor.	57.5	
						SW		SAND AND SILT: tan; 50% sand, very fine grained, round, poorly graded; 50% silt; dry, no odor.	58.0	
								SAND WITH GRAVEL: brown; 90% sand, medium to coarse grained, subround to round, well graded; 10% gravel, fine grained, subround to round; grain size descreases with depth, dry, no odor.	59.5	
14		36			60	SM		SAND AND SILT: tan; 60% sand, very fine to medium grained, round, well graded; 40% silt, slightly cemented, dry, no odor.	60.5	
								SAND WITH GRAVEL: brown; 80% sand, fine to coarse grained, subround to round, well graded, 20% gravel, fine to medium grained, subround to round, well graded; dry, no odor.		
11		36			65	SW		SAND WITH SILT: tan; 85% sand, very fine to coarse grained, subround to round, well graded; 10% silt; 5% gravel, medium to coarse grained, subround to round; slightly cemented, dry, no odor.		

Continued Next Page

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a **BORING/WELL NUMBER** B-3

PROJECT NAME Omega Chemical **DATE DRILLED** 11/4/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
									67.0	
						SW		SAND AND GRAVEL: brown; 70% sand, fine to coarse grained, subround to round, well graded, 30% gravel, fine to coarse grained, subround to round, well graded; dry, no odor.	68.0	
						ML		SILT: dark brown; 100% silt; high density, dry, no odor.	69 5	
						SM		SILT AND SAND: orangish brown; 60% silt; 35% sand, very fine to fine grained, subround to round, poorly graded; 5% gravel, medium to coarse grained, subround to round; high density, dry, no odor	70 0	
		84			70	SW SM		SAND, SILT, AND GRAVEL: brown; 35% sand, fine to coarse grained, subangular to round, well graded; 35% silt; 30% gravel, fine to coarse grained, subangular to round, well graded; trace of cobbles, round, maximum diameter of 2 inches; high density, moist, no odor.	73.0	
						SM		SAND AND SILT: brown; 60% sand, fine to coarse grained, subangular to round, well graded; 40% silt; trace of gravel, fine grained, subangular to round; moist, no odor.	75.0	
5 0		60			75	ML		SILT AND CLAY: brown; 55% silt; 30% clay; 5% gravel, fine to medium grained, round; high plasticity, high density, moist, no odor.	78 0	
						ML		SILT AND SAND WITH GRAVEL: brown; 50% silt; 40% sand, very fine to fine grained, subround to round, poorly graded; 10% gravel, medium to coarse grained, subround to round, poorly graded; high density, moist, no odor.		
11		60			80			SILT AND SAND WITH GRAVEL: yellowish brown; 50% silt; 40% sand, very fine to fine grained, subround to round, poorly graded; 10% gravel, medium to coarse grained, subround to round, poorly graded; high density, wet, no odor.	83.5	
						ML		SILT AND CLAY: yellowish brown; 70% silt; 30% clay; trace of sand, fine to medium grained, subround; high plasticity, high density, wet, no odor.	85.0	
2.0		60			85			Total Depth is 85 feet below ground surface (bgs) Groundwater was encountered at 67.4 feet bgs		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a
BORING/WELL NUMBER B-4
PROJECT NAME Omega Chemical
DATE DRILLED 11/6/03
LOCATION 12511 Putnam St, Whittier, CA
CASING TYPE/DIAMETER NA
DRILLING METHOD Sonic
SCREEN TYPE/SLOT NA
SAMPLING METHOD Continuous Core
GRAVEL PACK TYPE NA
GROUND SURFACE ELEVATION (FT MSL) NA
GROUT TYPE/QUANTITY Portland Cement / 5% Bentonite
TOP OF CASING ELEVATION (FT MSL) NA
STATIC WATER LEVEL (FT BELOW TOC) NM
LOGGED BY T. Titus
GROUND WATER ELEVATION (FT MSL)
REMARKS Well is on west side of Putnam St., north of Washington Blvd.

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								Concrete is 7" thick	0.6	
								Roadbase	1.0	
						ML		SILT: reddish brown; 90% silt; 5% sand, medium to coarse grained, rounded; 5% clay; high density, dry, no odor.		
		60			5					No Well Was Constructed
4.0		60			10					
								SILT WITH CLAY: reddish brown; 80% silt; 20% clay; non-plastic, medium density, dry, no odor.		
3.0		60			15					
						ML		SILT AND GRAVEL: orange; 70% silt; 30% gravel, fine to coarse grained, subround, well graded; trace cobbles, maximum diameter of 1 inch; high density, dry, no odor.	16.0	
								SILT WITH SAND: reddish brown; 90% silt; 10% sand, very fine to medium sand, subround; medium density, dry, no odor.	17.0	
					20					

Continued Next Page

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a **BORING/WELL NUMBER** B-4
PROJECT NAME Omega Chemical **DATE DRILLED** 11/6/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
2.0		60				ML				
5.0		60			25	ML		SILT AND CLAY WITH SAND: reddish brown; 40% silt; 40% clay; 20% sand, very fine to fine grained, round, poorly graded; moderate plasticity, medium density, dry, no odor. SILT AND CLAY: reddish brown; 60% silt; 40% clay; moderate plasticity, medium density, dry, no odor.	24.0	
3.0		60			30					
9.0		60			35	ML		SILT WITH SAND: brown; 90% silt; 10% sand, very fine to fine grained, round; high density, dry, no odor.	31.0	
						CL		CLAY AND SILT: reddish brown; 60% clay; 40% silt; high plasticity, medium density, moist, no odor.	36.0	
						SM		SAND AND SILT: reddish brown, 70% sand, very fine to fine grained, round, poorly graded; 30% silt; low density, moist, no odor.	39.0	
17		60			40			SILT WITH CLAY: reddish brown; 85% silt; 10% clay; 5% sand, very fine to fine grained, round; high density, dry, no odor.	40.0	

Continued Next Page

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a **BORING/WELL NUMBER** B-4

PROJECT NAME Omega Chemical **DATE DRILLED** 11/6/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
25		30			45					
26		60			50	ML		SILT AND SAND: reddish brown; 60% silt; 40% sand, very fine to fine grained, round, poorly graded; dry, no odor.		
87		60			55					
						SM		SAND AND SILT: light brown; 70% sand, very fine to fine grained, round, poorly graded; 30% silt; slightly cemented, dry, no odor.	59.0	
24		60			60	SP		SAND WITH SILT: reddish brown; 90% sand, very fine to fine grained, round, poorly graded; 20% silt; slightly cemented, dry, no odor.	59.5	
								SAND: light brown; 95% sand, medium grained, round, poorly graded, 5% silt; moist, no odor.		
24		48			65	SM		SAND AND SILT. tan; 80% sand, very fine to fine grained, round, poorly graded; 20% silt; slightly cemented, dry, no odor.	64.5 65.0	

Continued Next Page

NEWGINT OMEGA GPJ NEWGINT GDT 2/18/04

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-37240-T1.GW.Phase1a **BORING/WELL NUMBER** B-4
PROJECT NAME Omega Chemical **DATE DRILLED** 11/6/03

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								SAND: light brown; 100% sand, fine to medium grained, round, poorly graded; slightly cemented, moist, no odor.		
9.0		48			70	SP		SAND: reddish brown; 95% sand, fine to medium grained, round, poorly graded; 5% silt; moist, no odor.		
21		84			75	ML		SILT AND SAND WITH CLAY: orangish brown; 40% silt; 35% sand, very fine to fine grained, subround to round; 20% clay; 5% gravel, fine to medium grained, subround to round; low plasticity, medium density, moist, no odor.	75.0	
								SILT AND SAND WITH CLAY: orangish brown; 55% silt; 30% sand, very fine to fine grained, subround to round; 10% clay; 5% gravel, medium to coarse grained, subround to round; non-plastic, high density, moist, no odor.		
5.0		60			80	SW		SAND WITH GRAVEL: brown; 80% sand, fine to coarse grained, subround to round, well graded; 20% gravel, fine to coarse grained, subround to round, well graded; trace of cobbles, maximum diameter of 1 inch; wet, no odor	80.0	
						ML		SILT WITH SAND: yellowish brown; 80% silt; 15% sand, fine grained, round, poorly graded, 5% gravel, fine grained, round; high density, moist, no odor.	80.5	
								SILT WITH SAND AND GRAVEL: yellowish brown; 70% silt; 15% sand, fine to coarse grained, subround to round, well graded; 10% gravel, fine to coarse grained, subround to round, well graded; trace of cobbles, maximum diameter of 2 inches; high density, moist, no odor.		
1 0		60			85			Total Depth is 85 feet below ground surface (bgs). Groundwater was encountered at approximately 68 feet bgs.	85.0	

NEWGINT OM J NEWGINT GDT 2/18/04

PACIFIC SURVEYS

ELECTRIC LOG
LATEROLOG 3
GAMMA-RAY

Job No. 00724	Company	BC2 ENVIRONMENTAL
	Well	OW-4B
	Field	WHITTIER
File No.	County	LOS ANGELES State CA

Location:

12444 E WASHINGTON BLVD.

Sec. Twp. Rge

Other Services:

GR/LL3

Permanent Datum	G.L.		Elevation	Elevation
Log Measured From	G.L.	0	above perm. datum	K.B.
Drilling Measured From	G.L.			D.F.
				G.L.

Date	3-28-01		
Run Number	ONE		
Depth Driller	122'		
Depth Logger	122'		
Bottom Logged Interval	121'		
Top Log Interval	0'		
Casing Driller	10" @ 9'		
Casing Logger	9'		
Bit Size	9 5/8"		
Type Fluid in Hole	BENTONITE		
Density / Viscosity	N/A		
pH / Fluid Loss	N/A		
Source of Sample	PIT		
Rm @ Meas Temp	6.4 @ 77F		
Rmf @ Meas Temp	7 3 @ 77F		
Rmc @ Meas Temp	N/A		
Source of Rmf / Rmc	MEAS		
Rm @ BHT	N/A		
Time Circulation Stopped	0 HRS		
Time Logger on Bottom			
Max. Recorded Temperature	N/A		
Equipment Number	PS-1		
Location	L A		
Recorded By	RIDDER		
Witnessed By	W GROVE		

Calibration Report

Serial-Model:	100-2-A
Calibration Performed:	Tue Mar 27 12:01:50 2001

SP Calibration: Spontaneous Potential

System Reading	Calibration Reference
-0.331 V	-98.800 mV
0.543 V	98.800 mV
Gain= 226.087	Offset= -23.965

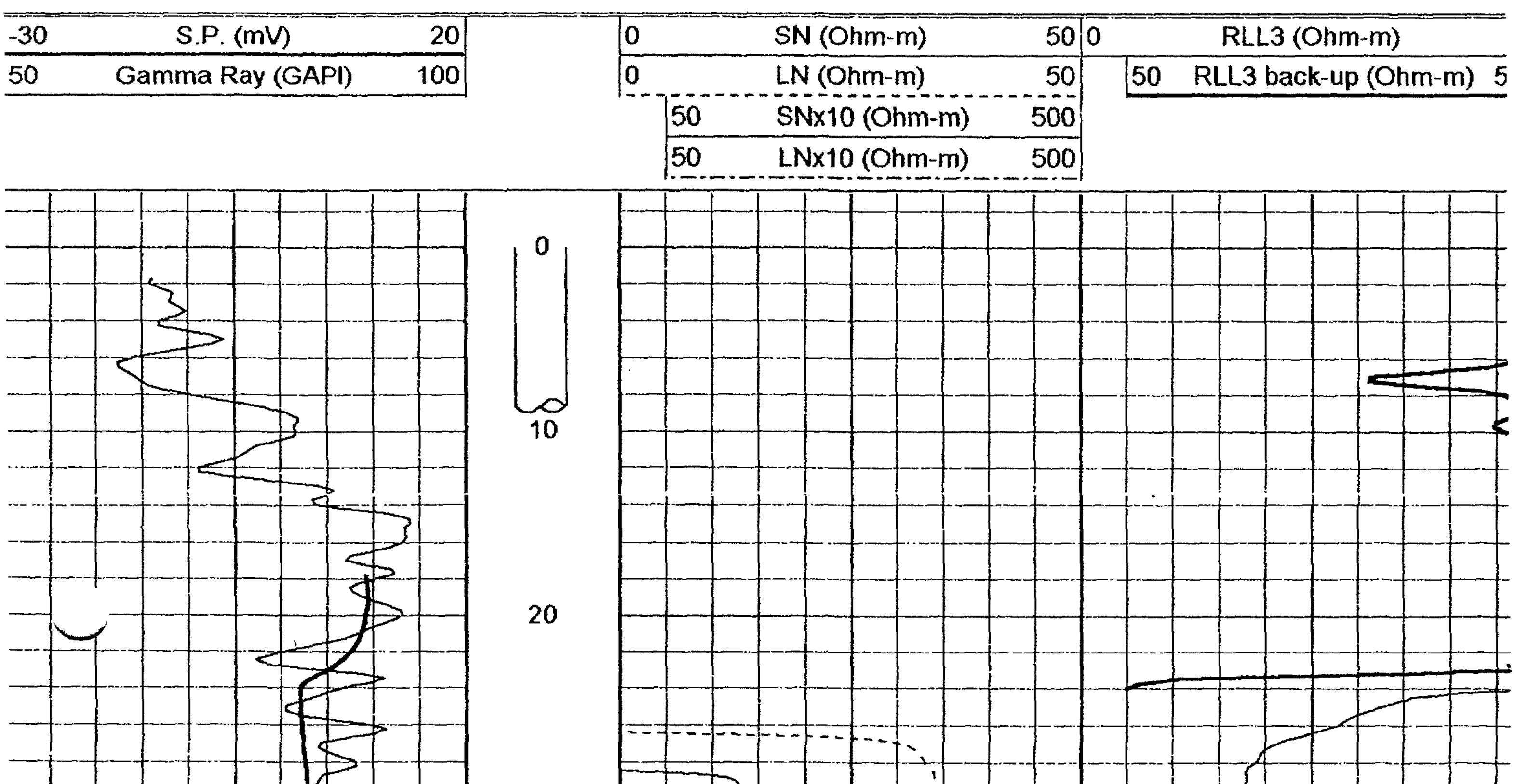
RSN Calibration: Resistivity Short Normal

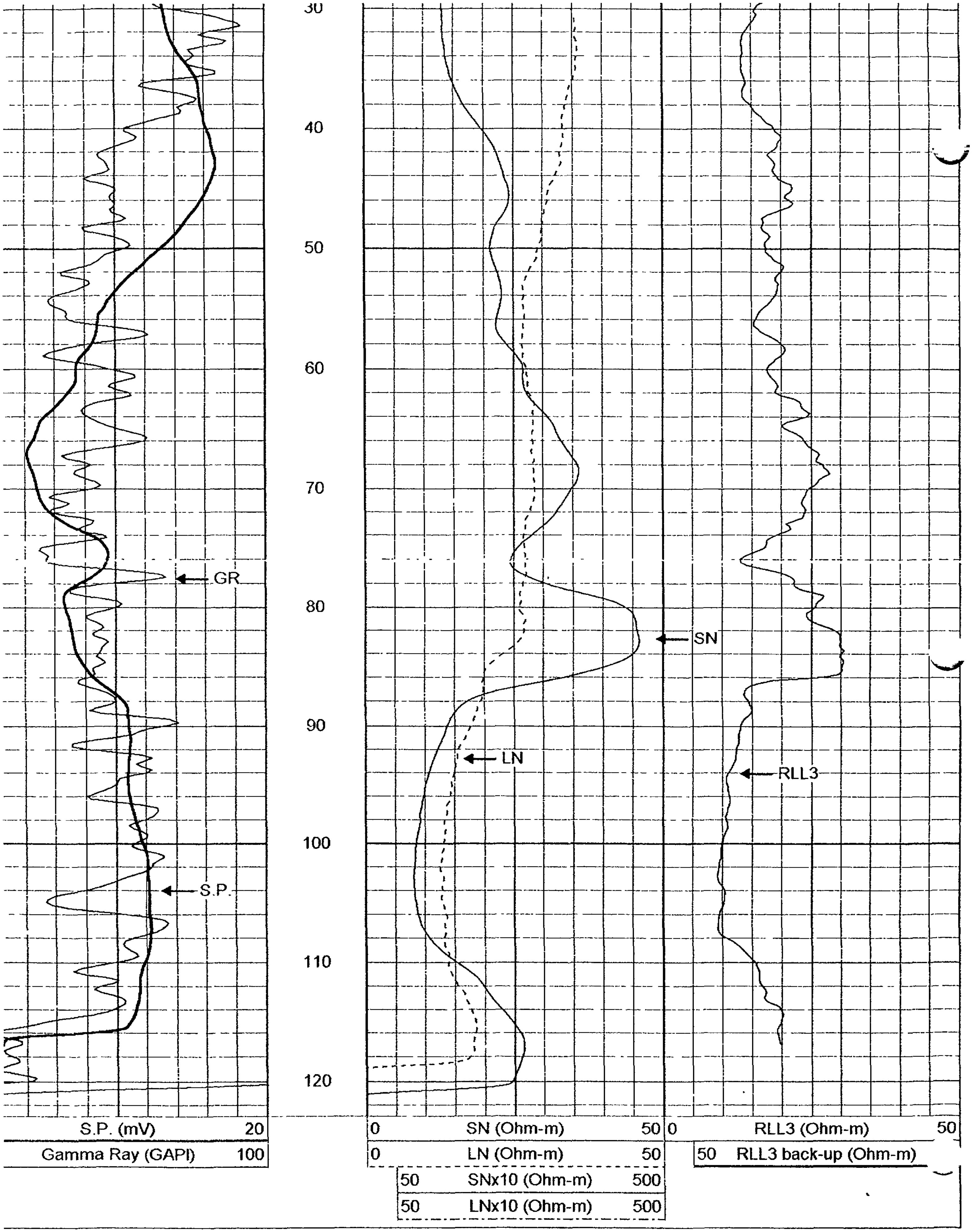
System Reading	Calibration Reference
0.046 V	10.200 Ohm-m
0.404 V	102.200 Ohm-m
Gain= 257.157	Offset= -1.726

RLN Calibration: Resistivity Long Normal

System Reading	Calibration Reference
0.018 V	10.200 Ohm-m
0.110 V	102.200 Ohm-m
Gain= 999.333	Offset= -5.159

Database File:	00724.db
Dataset Pathname:	BC2/OW4B/LL3/merge1
Presentation Format:	elog2
Dataset Creation:	Wed Mar 28 19:23:50 2001
Charted by:	Depth in Feet scaled 1:120





30
40
50
60
70
80
90
100
110
120
GR
S.P.
SN
LN
RLL3
S.P. (mV) 20
Gamma Ray (GAPI) 100
0 SN (Ohm-m) 50
0 LN (Ohm-m) 50
50 SNx10 (Ohm-m) 500
50 LNx10 (Ohm-m) 500
0 RLL3 (Ohm-m) 50
50 RLL3 back-up (Ohm-m)

PACIFIC SURVEYS

ELECTRIC LOG
LATEROLOG 3
GAMMA RAY

Job No 11532	Company	BC2 ENVIRONMENTAL
	Well	OW-Ø 8b
	Field	WHITTIER
File No	County	LOS ANGELES State CA

Location:

NORTH OF WASHINGTON BLVD ON PUTNAM
OMEGA CHEMICAL

Other Services.

GR/LL3

Sec. Twp Rge.

...manent Datum	G.L.		Elevation	Elevation
...g Measured From	G.L.	0'	above perm. datum	K.B
Drilling Measured From	G.L.			D.F. G.L

Date	8-17-04		
Run Number	ONE		
Depth Driller	143'		
Depth Logger	144'		
Bottom Logged Interval	143'		
Top Log Interval	25'		
Casing Driller	10" @ 6.5'		
Casing Logger	N/A		
Bit Size	7 7/8"		
Type Fluid in Hole	BENTONITE		
Density / Viscosity	N/A		
pH / Fluid Loss	N/A		
Source of Sample	PIT		
Rm @ Meas Temp	8.5 @ 77F		
Rmf @ Meas. Temp	8 9 @ 77F		
Rmc @ Meas. Temp	N/A		
Source of Rmf / Rmc	MEAS		
Rm @ BHT	N/A		
Time Circulation Stopped	9:00 AM		
Time Logger on Bottom	9.40 AM		
Max. Recorded Temperature	N/A		
Equipment Number	PS-2		
L...ion	L A.		
R...ded By	LAPORTE		
Witnessed By	W GROVE		

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Comments

ELOG Calibration Report

Serial	D1
Model	DTQ
Shop Calibration Performed	Fri Jan 30 11 16 58 2004
Before Survey Verification Performed	Wed Jul 30 13 25 36 2003
After Survey Verification Performed	Wed Jul 30 13 26 22 2003

Shop Calibration

	Readings			References			Results	
	Zero	Cal		Zero	Cal		Gain	Offset
Short	7 661	98 983		10 200	102 200	Ohm-m	1 007	2 483
Long	4 794	94 211		10 200	102 200	Ohm-m	1 029	-17 319
IEE	105 852	4589 704	counts	0 116	5 023	A		
VSN	8 037	5131 815	counts	0 153	97 883	V		
VLN	190 704	1376 852	counts	3 637	26 262	V		

Before Survey Verification

	Readings			References			Results	
	Zero	Cal		Zero	Cal		Gain	Offset
Short	71 176	99 664		0 663	0 065	Ohm-m	-0 021	2 156
Long	982 780	106 280		6 195	6 195	Ohm-m	0 830	-82 041
IEE	106 815	4716 537	counts	0 117	5 162	A		
VSN	85 417	5281 259	counts	1 629	100 734	V		
VLN	294 852	1407 963	counts	5 624	26 855	V		

After Survey Verification

	Readings			References			Results	
	Zero	Cal		Zero	Cal		Gain	Offset
Short	70 260	99 683		71 176	99 664	Ohm-m	0 968	3 150
Long	970 990	106 308		106 280	106 280	Ohm-m	1 014	-1 481
IEE	107 528	4719 806	counts	0 118	5 165	A		
VSN	84 880	5285 926	counts	1 619	100 823	V		
VLN	293 259	1409 306	counts	5 594	26 881	V		

After Survey Verification compared to Before Survey Calibration

	Zero			Cal		
	Before	After		Before	After	
Short	0 663	71 176	Ohm-m	0 065	99 664	Ohm-m
Long	733 883	982 780	Ohm-m	6 195	106 280	Ohm-m

Gamma Ray Calibration Report

Serial Number	D1	
Tool Model	ELOG	
Performed	Fri Jan 30 11 08 21 2004	
Calibrator Value	162	GAPI
Background Reading	167 616	cps
Calibrator Reading	722 887	cps
Sensitivity	0 291747	GAPI/cps

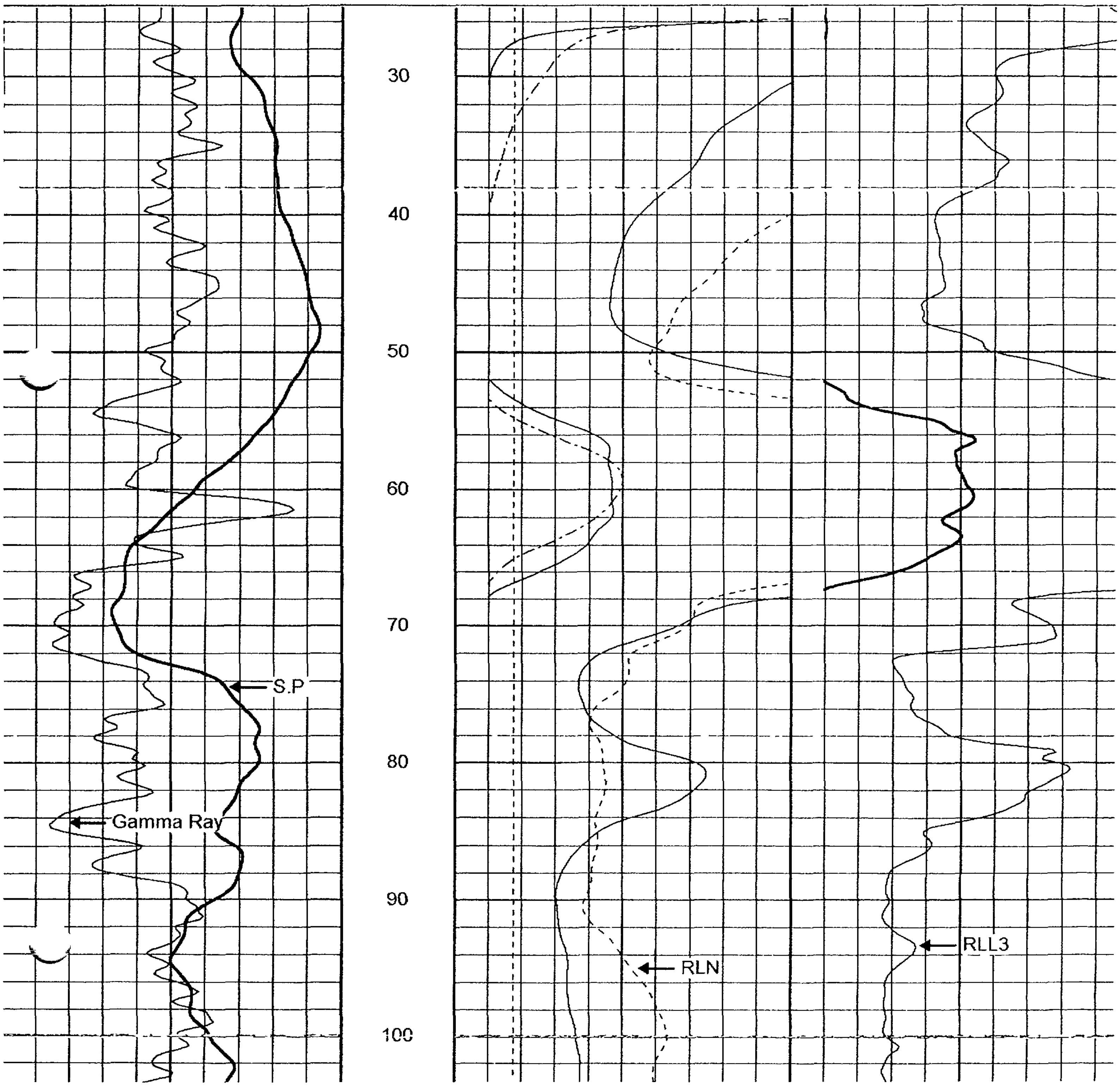
Sensitivity 0 291747 GAPI/cps

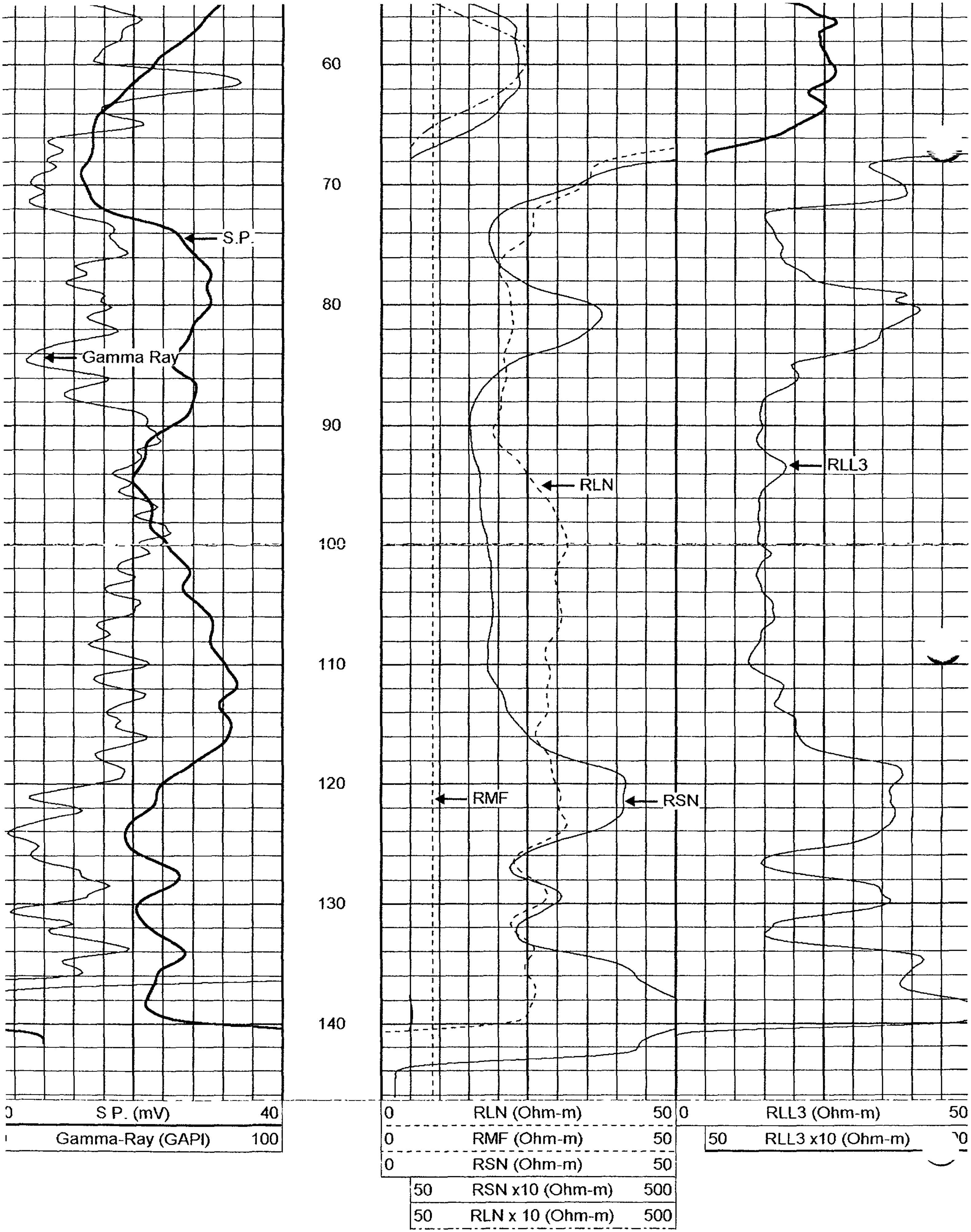
Database File	11532 db
Dataset Pathname	BC2/OW9/run1/ElogF
›sentation Format	elog2
›taset Creation	Tue Aug 17 10 05 27 2004
Charted by	Depth in Feet scaled 1 120

-10	S P (mV)	40
50	Gamma-Ray (GAPI)	100

0	RLN (Ohm-m)	50
0	RMF (Ohm-m)	50
0	RSN (Ohm-m)	50
50	RSN x10 (Ohm-m)	500
50	RLN x 10 (Ohm-m)	500

0	RLL3 (Ohm-m)	5
50	RLL3 x10 (Ohm-m)	50





60
70
80
90
100
110
120
130
140
S.P.
Gamma Ray
RLN
RLL3
RMF
RSN
0 S.P. (mV) 40
Gamma-Ray (GAPI) 100
0 RLN (Ohm-m) 50
0 RMF (Ohm-m) 50
0 RSN (Ohm-m) 50
50 RSN x10 (Ohm-m) 500
50 RLN x 10 (Ohm-m) 500
0 RLL3 (Ohm-m) 50
50 RLL3 x10 (Ohm-m)

Appendix B
Completed Field Forms

Well No.: OW1	Site: OMEGA	Date: 8/26/04
Client: OPOG	Project Number: 10500 - 37420	
Well Casing Diameter (inches). 4"	Well Casing Material: PVC SS Other.	
Well Headspace: PID (ppm):	FID (ppm): N/A	
Samplers: PEARL PEREIRA with CDM	TREI CHATMAN with Blaine Tech	

Total Depth of Well (feet): 82.65 — 2" - 0.16

Depth to Water (feet): 78.84 (X) 4" - 0.65 Gal/ft. = 2.48 (X) 3 = 62.96

Water Column Height (feet): 3.81 — 6" - 1.47 — 48.51 — Minimum purge volume (gallons)

Well Reference Point: TOC — _" - _

PURGE METHOD: Submersible pump ☐ Bladder pump ☐ Disposable bailer ☐	
Pump Make/Model: 2" Grundfos Rediflo	Depth of pump intake (feet).
Purge equipment decontaminated? Y ☒ N ☐	Container type: 55g drums
Purge/decon water containerized? Y ☒ N ☐	Volume: 55g

Start Time: 855 Flow Rate. 0.25

Time	Gallons	Temp. (°C/°F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	DTW (ft TOC)	Comments
857	0.5	21.9	6.80	1596	113	0.99	-79		
901	1.5	22.3	6.74	1602	106	1.02	-79		
905	2.5	Well Dewatered						81.60	

* Recovery overnight
Sampled on 8/27/04 @ 8:00 am

Chemets DO (mg/L):

	Method	Container Type/Volume	Preservative
Sample Analyses: →	8260B + TICs	40ml VOAS	HCL
	8270M	1L ABG	—

Sample Collection Method:

Pump ☒ Flow Rate: —	Sample ID: OC-GW-OW1-082704	Sample Time: 8:00
Bailer ☒ Type: disposable	Duplicate ID: OC-GW-OW1K-082704	Sample Time: 8:00
Other: ☐ Desc.:	Equip blank ID:	Sample Time:

CDM

MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW 16	Site: OMEGA	Date: 8/26/04
Client: OPOG	Project Number: 10500 - 37240	
Well Casing Diameter (inches): 4"	Well Casing Material: PVC SS Other:	

Well Headspace: PID (ppm): FID (ppm): N/A

Samplers: PEARL PEREIRA with CDM TREI CHATMAN with Blaine Tech

Total Depth of Well (feet): 118.40 2" - 0.16

Depth to Water (feet): 82.80 (X) 4" - 0.65 Gal/ft. = 23.14 (X) 3 = 165.03

Water Column Height (feet): 35.6 6" - 1.47 31.87 Minimum purge volume (gallons)

Well Reference Point: TOC __" - ____

PURGE METHOD: Submersible pump ☐ Bladder pump ☐ Disposable bailer ☐

Pump Make/Model: 2" Grundfos Rediflo	Depth of pump intake (feet):
Purge equipment decontaminated? Y ☒ N ☐	Container type: 55g drums
Purge/decon water containerized? Y ☒ N ☐	Volume: 55g

Start Time: 724 Flow Rate: 0.5 gpm

Time	Gallons	Temp. (°C/°F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	DTW (ft TOC)	Comments
728	2	22.1	7.56	941	213	0.69	75	88.65	Odor
732	4	22.3	7.45	890	119	0.51	-7	91.10	
736	6	22.5	7.42	858	84	0.51	-77	93.50	
740	8	22.4	7.35	837	46	0.55	-112	97.21	
744	10	22.7	7.27	830	39	0.50	-134	98.90	
748	12	22.7	7.48	822	32	0.49	-139	101.23	
756	16	22.6	7.48	822	29	0.58	-131	104.38	
804	20	22.9	7.49	829	52	0.68	-126	109.18	
812	24	23.2	7.47	834	338	0.67	-129	112.90	
820	28	23.3	7.50	905	328	0.58	-110	116.95	
822	29	Well dewatered							

* Recovery overnight.
Sampled on 8/27/04 @ 7:30 am.

Chemets DO (mg/L):__________

	Method	Container Type/Volume	Preservative
Sample Analyses: →	8260B + TICs	40 ml VOAs	HCl
	8270M	1L ABG	—
Sample Collection Method:	MS/MSD	[6x 40ml VOAs + 2x 1L ABG]	HCl

Pump: ☒ Flow Rate:	Sample ID: OC-GW-OW16-082704	Sample Time: 7:30
Bailer: ☒ Type: disposable	Duplicate ID:	Sample Time:
Other: ☐ Desc.:	Equip. blank ID:	Sample Time:

CDM MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW 2	Site: OMEGA	Date: 8/24/04
Client: OPOG	Project Number: 10500-37240	
Well Casing Diameter (inches): 4"	Well Casing Material: PVC SS Other:	
Well Headspace: PID (ppm):	FID (ppm): N/A	
Samplers: PEARL PEREIRA with CDM	TREI CHATMAN with Blaine Tech	

Total Depth of Well (feet): 80.0 2" - 0.16

Depth to Water (feet): 71.24 (X) 4" 0.65 Gal/ft. = 5.69 (X) 3 = 109.60 ← Minimum purge volume (gallons)

+30.84

Water Column Height (feet): 8.76 6" - 1.47

Well Reference Point: **TOC** __" - ___

PURGE METHOD: Submersible pump ☐ Bladder pump ☐ Disposable bailer ☐	
Pump Make/Model: 2" Grundfos Rediflo	Depth of pump intake (feet): 79
Purge equipment decontaminated? Y ☒ N ☐	Container type: 55g drum
Purge/decon water containerized? Y ☒ N ☐	Volume: 55g

Start Time: 1114 Flow Rate: 2.0 gpm STOPPED → 1.0 gpm

Time	Gallons	Temp. (°C/°F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	DTW (ft TOC)	Comments
1124	20	22.9	7.31	1230	28	2.60	64	78.00	Stop Pump → DRY Flow Rate 1.0 gpm
1144	40	24.1	7.24	1225	2	3.29	72	75.15	
1204	60	25.7	7.23	1232	2	3.23	72	75.70	
1224	80	23.6	7.23	1226	2	3.24	70	76.10	
1234	90	23.5	7.20	1229	2	3.28	68	76.30	
1244	100	24.0	7.20	1226	2	3.30	68	76.40	
1254	110	24.0	7.19	1225	2	3.20	66	76.55	

Chemets DO (mg/L):__________

	Method	Container Type/Volume	Preservative
Sample Analyses: →	8260B (MTBE + Freon + Acetone + TICs)	40 ml VOAs	HCL
Sample Collection Method: ↘	8270M (1,4-dioxane)	1L AB G	—

Pump: ☒ Flow Rate: 0.5 gpm	Sample ID: OC-GW-OW2-082404	Sample Time: 1300
Bailer: ☐ Type: disposable	Duplicate ID:	Sample Time:
Other. ☐ Desc.:	Equip. blank ID:	Sample Time:

CDM MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW 3	Site: OMEGA	Date: 8/24/04
Client: OPOG	Project Number: 10500 - 37420	
Well Casing Diameter (inches): 4"	Well Casing Material: PVC SS Other:	

Well Headspace: PID (ppm): 300 / 0.0 FID (ppm): N/A

Samplers: PEARL PEREIRA with CDM TREI CHATMAN with Blaine Tech

Total Depth of Well (feet): 82.80 2" - 0.16

Depth to Water (feet): 67.13 (X) 4" (0.65) Gal/ft. = 10.19 (X) 3 = 113.97 ← Minimum purge volume (gallons)

27.80

37.99

Water Column Height (feet): 15.67 6" - 1.47

Well Reference Point: TOC __" - ___

PURGE METHOD: Submersible pump ☐ Bladder pump ☐ Disposable bailer ☐

Pump Make/Model: 2" Grundfos Rediflo	Depth of pump intake (feet): 80.0'
Purge equipment decontaminated? Y ☒ N ☐	Container type: 55 g drums
Purge/decon water containerized? Y ☒ N ☐	Volume: 55g

Start Time: 818 Flow Rate: 2.0 gpm

Time	Gallons	Temp. (°C/°F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	DTW (ft TOC)	Comments
823	10	21.8	7.30	1385	7	—	109	68.99	
828	20	22.3	7.07	1351	4	—	85	70.50	
833	30	22.4	7.00	1361	3	4.24	80	70.90	
838	40	22.4	7.00	1371	3	4.23	70	71.30	
843	50	22.3	7.01	1376	3	4.20	77	72.30	
848	60	22.2	7.01	1384	8	4.19	70	73.70	
853	70	22.4	7.01	1378	18	4.39	70	75.34	
858	80	22.3	7.00	1382	17	4.15	70	76.90	
903	90	22.3	7.06	1390	40	4.19	70	78.04	
908	100	22.3	7.10	1382	104	4.16	69	79.40	Flow Rate 1.0 gpm
913	105	22.6	7.03	1374	12	4.19	67	77.04	
918	110	22.7	7.00	1372	5	4.20	67	75.98	
923	115	22.6	6.99	1373	3	4.21	66	75.60	
928	120	22.6	6.97	1371	2	4.21	67	74.90	

Chemets DO (mg/L):___________

	Method	Container Type/Volume	Preservative
Sample Analyses: →	8270M (1,4 - dioxane)	1L ABG	—
Sample Collection Method:	8260B (MTBE + FREONS + ACETONE + TICS)	40 mL VOAs	HCL

Pump: ☒ Flow Rate: 0.3 gpm	Sample ID: OC - GW - OW3 - 082404	Sample Time: 935
Bailer: ☐ Type: disposable	Duplicate ID:	Sample Time:
Other: ☐ Desc.:	Equip. blank ID:	Sample Time:

CDM MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-4a	Site: OMEGA	Date: 8/25/04
Client. OPOG	Project Number: 10500-37240	
Well Casing Diameter (inches): 4"	Well Casing Material: PVC SS Other:	
Well Headspace: PID (ppm):	FID (ppm): N/A	
Samplers: PEARL PEREIRA with CDM	TREI CHATMAN	with Blaine Tech

Total Depth of Well (feet): 74.65 2" - 0.16

Depth to Water (feet): 62.36 (X) 4" - 0.65 Gal/ft. = 7.99 (X) 3 = 110.34

28.79

Water Column Height (feet): 12.29 6" - 1.47 Minimum purge volume (gallons)

Well Reference Point: TOC ___" - ____

PURGE METHOD: Submersible pump ☐ Bladder pump ☐ Disposable bailer ☐	
Pump Make/Model: 2" Grundfos Rediflo	Depth of pump intake (feet): 72
Purge equipment decontaminated? Y ☒ N ☐	Container type: 55g drum
Purge/decon water containerized? Y ☒ N ☐	Volume: 55g

Start Time: 822 Flow Rate: 5 gpm

Time	Gallons	Temp. (°C/°F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	DTW (ft TOC)	Comments
826	20	22.4	6.93	1223	2	2.60	90	63.38	
830	40	22.5	6.90	1215	2	2.79	91	63.24	
832	50	22.6	6.82	1219	2	2.60	64	63.24	
834	60	22.6	6.84	1221	1	2.61	83	63.24	
836	70	22.7	6.86	1214	1	2.69	80	63.25	
838	80	22.7	6.88	1216	1	2.70	79	63.25	
840	90	22.7	6.85	1213	1	2.69	73	63.26	
842	100	22.7	6.85	1214	1	2.69	73	63.26	
845	115	22.7	6.84	1217	1	2.71	70	63.26	

Chemets DO (mg/L):__________

	Method	Container Type/Volume	Preservative
Sample Analyses: →	8260B (TICs + MTBE + Acetone + Freon)	40 ml VOAs	HCl
Sample Collection Method:	8270M (1,4-dioxane)	1L ABG	—

Pump: ☒ Flow Rate: 0.3 gpm	Sample ID: OC-GW-OW4a-082504	Sample Time: 850
Bailer: ☐ Type: disposable	Duplicate ID: OC-GW-OW4a-082504	Sample Time: 855
Other: ☐ Desc.:	Equip. blank ID:	Sample Time:

CDM

MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW 4b	Site: OMEGA	Date: 8/25/04
Client. OPOG	Project Number:	
Well Casing Diameter (inches): 4"	Well Casing Material: PVC SS Other:	

Well Headspace: PID (ppm): FID (ppm): N/A

Samplers: PEARL PEREIRA with CDM TREI CHATMAN with Blaine Tech

Total Depth of Well (feet): 126.70 2" - 0.16

Depth to Water (feet): 71.10 (X) 4" - 0.65 Gal/ft. = 36.14 (X) 3 = 177.81

23 13

Water Column Height (feet): 55.60 6" - 1.47 Minimum purge volume (gallons)

Well Reference Point: **TOC** ___" - ___

PURGE METHOD: Submersible pump ☐ Bladder pump ☐ Disposable bailer ☐

Pump Make/Model: 2" Grundfos Rediflo	Depth of pump intake (feet); 125
Purge equipment decontaminated? Y ☒ N ☐	Container type: 55 g drums
Purge/decon water containerized? Y ☒ N ☐	Volume: 55g

Start Time: 718 Flow Rate: 5.0 gpm

Time	Gallons	Temp. (°C/°F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	DTW (ft TOC)	Comments
722	20	22.2	7.40	1372	8	3.05	91	75.28	
730	60	22.1	7.22	1364	3	2.99	92	75.43	
734	80	22.3	7.12	1362	2	2.98	66	75.48	
738	100	22.3	7.10	1360	2	2.96	60	75.50	
742	120	22.2	7.12	1359	2	2.99	76	75.52	
750	160	21.9	7.10	1354	2	3.00	70	75.54	
752	170	22.3	7.10	1365	2	3.00	69	75.58	
754	180	22.3	7.14	1362	2	3.00	69	75.60	

Chemets DO (mg/L):________

	Method	Container Type/Volume	Preservative
Sample Analyses: →	8260B (Acetone + MTBE + Freon + TICs)	40 ml VOAs	HCL
Sample Collection Method:	8270M (1,4-dioxane)	1L ABG	—

Pump: ☒ Flow Rate: 0.5 gpm	Sample ID: OC-GW-OW4b-082504	Sample Time: 800
Bailer: ☐ Type: disposable	Duplicate ID: ~~OC-GW-OW4bK-082504~~	Sample Time:
Other: ☐ Desc.:	Equip. blank ID:	Sample Time:

CDM MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW5	Site: OMEGA	Date: 8/25/04
Client: OPOG	Project Number: 10500-37240	
Well Casing Diameter (inches): 4"	Well Casing Material: PVC SS Other:	

Well Headspace: PID (ppm): FID (ppm): N/A

Samplers: PEARL PEREIRA with CDM TREI CHATMAN with Blaine Tech

Total Depth of Well (feet):	49.68	2" - 0.16		
Depth to Water (feet):	36.78	(X) 4" - 0.65 Gal/ft. =	8.39 26.73	(X) 3 = 105.36
Water Column Height (feet):	12.90	6" - 1.47		Minimum purge volume (gallons)
Well Reference Point: TOC		" -		

PURGE METHOD: Submersible pump ☐ Bladder pump ☐ Disposable bailer ☐

Pump Make/Model: 2" Grundfos Rediflo	Depth of pump intake (feet): 48
Purge equipment decontaminated? Y ☒ N ☐	Container type: 55g drums
Purge/decon water containerized? Y ☒ N ☐	Volume: 55g

Start Time: 1036 Flow Rate: 5.0 gpm

Time	Gallons	Temp. (°C/°F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	DTW (ft TOC)	Comments
1040	20	22.4	7.09	1347	129	2.82	87	37.11	
1042	30	22.4	7.00	1341	77	2.83	66	37.11	
1044	40	22.4	6.99	1341	50	2.90	60	—	
1046	50	22.4	7.00	1339	32	2.99	60	37.11	
1048	60	22.4	6.99	1338	19	3.00	59	—	
1050	70	22.4	7.00	1338	14	2.99	60	37.11	
1052	80	22.4	7.06	1338	10	3.00	60	—	
1054	90	22.4	7.00	1339	8	3.01	59	37.11	
1056	100	22.4	7.00	1338	5	3.02	58	—	
1058	110	22.4	7.00	1337	5	3.02	58	37.11	

Chemets DO (mg/L):

	Method	Container Type/Volume	Preservative
Sample Analyses: →	8260B + TICs	40 ml VOAS	HCL
	8270M	1L ABG	—
Sample Collection Method:			

Pump: ☒ Flow Rate: 0.5 gpm	Sample ID: OC-GW-OW5-082504	Sample Time: 1105
Bailer: ☐ Type: disposable	Duplicate ID:	Sample Time:
Other: ☐ Desc.:	Equip. blank ID:	Sample Time:

CDM MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW6	Site: OMEGA	Date: 8/25/04
Client: OPOG	Project Number: 10500 - 37240	
Well Casing Diameter (inches): 6"	Well Casing Material: PVC SS Other:	
Well Headspace: PID (ppm):	FID (ppm): N/A	
Samplers: PEARL PEREIRA with CDM	TREI CHATMAN	with Blaine Tech

Total Depth of Well (feet): 58.35 2" - 0.16

Depth to Water (feet): 51.69 (X) 4" - 0.65 Gal/ft. = 4.329 (X) 3 = 83.94

Water Column Height (feet): 6.66 6" - 1.47 23.65 Minimum purge volume (gallons)

Well Reference Point: TOC "-

PURGE METHOD: Submersible pump ☐	Bladder pump ☐	Disposable bailer ☐
Pump Make/Model: 2" Grundfos Rediflo	Depth of pump intake (feet): ~~58~~ 58	
Purge equipment decontaminated? Y ☒ N ☐	Container type: 55g drums	
Purge/decon water containerized? Y ☒ N ☐	Volume: 55g	

Start Time: 951 Flow Rate: 5 gpm

Time	Gallons	Temp. (°C/°F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	DTW (ft TOC)	Comments
953	10	22.2	7.11	1628	2	3.51	114	51.92	
955	20	22.2	6.91	1626	1	3.19	72	51.93	
957	30	22.2	6.91	1626	1	3.10	81	51.94	
959	40	22.1	6.90	1626	1	3.06	80	51.94	
1001	50	22.1	6.90	1627	1	3.10	60	—	
1003	60	22.1	6.94	1625	1	3.19	60	51.95	
1005	70	22.1	6.98	1628	0	3.21	59	—	
1007	80	22.1	6.90	1627	0	3.24	60	51.95	
1009	90	22.1	6.90	1627	0	3.26	60	51.95	

Chemets DO (mg/L): ______

	Method	Container Type/Volume	Preservative
Sample Analyses: →	8260B + TICS	40 ml VOAS	HCL
	8270M	1L ABG	—
Sample Collection Method:			

Pump: ☒ Flow Rate: 0.5gpm	Sample ID: OC-GW-OW6-082504	Sample Time: 1015
Bailer: ☐ Type: disposable	Duplicate ID:	Sample Time:
Other: ☐ Desc.:	Equip. blank ID:	Sample Time:

CDM MONITORING WELL PURGE AND SAMPLING FORM

Well No. OW 7	Site: OMEGA	Date 8/25/04
Client: OPOG	Project Number: 10500 - 37420	
Well Casing Diameter (inches): 4"	Well Casing Material: PVC SS Other:	

Well Headspace: PID (ppm): FID (ppm): N/A

Samplers: PEARL PEREIRA with CDM TREI CHATMAN with Blaine Tech

Total Depth of Well (feet): 89.35 2" - 0.16

Depth to Water (feet): 78.96 (X) 4" - 0.65 Gal/ft. = 6.75 (X) 3 = 105.10 ← Minimum purge volume (gallons)

28 27

Water Column Height (feet): 10.39 6" - 1.47

Well Reference Point TOC ___" - ___

PURGE METHOD: Submersible pump ☐ Bladder pump ☐ Disposable bailer ☐

Pump Make/Model: 2" Grundfos Rediflo	Depth of pump intake (feet): 88
Purge equipment decontaminated? Y ☒ N ☐	Container type: 55g drums
Purge/decon water containerized? Y ☒ N ☐	Volume: 55g

Start Time: 1127 Flow Rate: 2 gpm → 1.0 gpm

Time	Gallons	Temp. (°C/°F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	DTW (ft TOC)	Comments
1132	10	22.0	7.18	1363	11	2.61	73	83.95	Flow Rate 1.0 gpm
1142	20	22.4	7.16	1351	5	3.46	77	83.98	
1152	30	22.4	7.14	1346	3	3.65	72	83.95	
1202	40	22.6	7.10	1342	1	3.66	80	83.80	
1212	50	22.7	7.00	1340	1	3.78	78	83.81	Flow Rate 1.5 gpm
1222	60	22.7	7.09	1340	21	3.74	117	85.80	
1232	80	22.8	7.06	1335	145	3.60	95	87.35	Flow Rate 1.0 gpm
1242	90	23.2	7.17	1340	52	3.90	90	87.78	
1252	100	23.0	7.11	1336	18	3.93	89	87.80	
1257	105	23.0	7.16	1329	10	3.89	80	87.81	

Chemets DO (mg/L):____________

	Method	Container Type/Volume	Preservative
Sample Analyses: →	8260B + TICs	40 ml VOAs	HCL
	8270 M	1L ABG	—
Sample Collection Method:			

Pump: ☒ Flow Rate. 0.5 gpm	Sample ID: OC - GW - OW7 - 082504	Sample Time: 1305
Bailer: ☐ Type: disposable	Duplicate ID:	Sample Time:
Other: ☐ Desc.:	Equip. blank ID:	Sample Time:

CDM MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-8	Site: OMEGA	Date: 8/24/04
Client: OPOG	Project Number: 10500-3	
Well Casing Diameter (inches): 4"	Well Casing Material: PVC SS Other:	

Well Headspace: PID (ppm): FID (ppm): N/A

Samplers: PEARL PEREIRA with CDM TREI CHATMAN with Blaine Tech

Total Depth of Well (feet): 79.47 2" - 0.16

Depth to Water (feet): 69.15 (X) 4" - 0.65 Gal/ft. = 6.71 (X) 3 = 100.31

Water Column Height (feet): 10.32 6" - 1.47 26.73 Minimum purge volume (gallons)

Well Reference Point: TOC __" - ____

PURGE METHOD: Submersible pump ☐ Bladder pump ☐ Disposable bailer ☐

Pump Make/Model: 2" Grundfos Rediflo	Depth of pump intake (feet): 78
Purge equipment decontaminated? Y ☒ N ☐	Container type: 55 g drums
Purge/decon water containerized? Y ☒ N ☐	Volume: 55g

Start Time: 1401 Flow Rate: 3 gpm

Time	Gallons	Temp. (°C/°F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	DTW (ft TOC)	Comments
1405	12	23.6	7.19	2006	2	0.77	-135	69.80	
1409	24	23.3	7.07	1960	1	0.80	-138	69.80	
1413	36	22.8	7.05	1962	1	0.84	-130	69.80	
1417	48	22.7	6.95	1979	1	0.80	-130	69.80	
1425	72	22.7	6.91	1995	1	0.80	-128	69.80	
1429	84	22.5	6.90	2011	1	0.84	-128	69.80	
1433	96	22.5	6.90	2035	1	0.89	-127	69.80	
1435	102	22.5	6.89	2032	1	0.89	-127	69.80	

Chemets DO (mg/L): ________

	Method	Container Type/Volume	Preservative
Sample Analyses: →	8260B (MTBE + TICs Freon + Acetone)	40 ml VOAs	HCL
Sample Collection Method:	8270M (1,4-dioxane)	1L ABG	—

Pump: ☒ Flow Rate: 0.5 gpm	Sample ID: OC-GW-OW8-082404	Sample Time: 1440
Bailer: ☐ Type: disposable	Duplicate ID:	Sample Time:
Other: ☐ Desc.:	Equip. blank ID: OC-GW-OW8N-082404	Sample Time: 1445

CDM

MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-8b	Site: OMEGA	Date: 8/24/04
Client OPOG	Project Number: 10500-37240	
Well Casing Diameter (inches): 4"	Well Casing Material: PVC SS Other:	

Well Headspace: PID (ppm): 10.0 FID (ppm): N/A

Samplers: PEARL PEREIRA with CDM TREI CHATMAN with Blaine Tech

Total Depth of Well (feet): 125.97 2" - 0.16

Depth to Water (feet): 86.77 (X) 4" - 0.65 Gal/ft. = 25.48 (X) 3 = 122.71

\+ 15.42 ← Minimum purge volume (gallons)

Water Column Height (feet): 39.2 6" - 1.47

Well Reference Point: TOC ___" - ____

PURGE METHOD: Submersible pump ☐ Bladder pump ☐ Disposable bailer ☐

Pump Make/Model: 2" Grundfos Rediflo	Depth of pump intake (feet): 124
Purge equipment decontaminated? Y ☒ N ☐	Container type: 55 g drums
Purge/decon water containerized? Y ☒ N ☐	Volume: 55 gallons

Start Time: 1008 Flow Rate: 2

Time	Gallons	Temp. (°C/°F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	DTW (ft TOC)	Comments
1013	10	22.6	7.61	1119	9	4.12	60	87.88	Flowrate 5.0 gpm
1017	30	22.6	7.23	1116	5	4.49	68	88.80	
1019	40	22.5	7.40	1115	3	4.10	60	88.85	
1023	60	22.7	7.34	1116	1	4.11	58	88.98	
1027	80	22.6	7.31	1120	1	4.09	57	89.04	
1031	100	22.7	7.34	1128	1	4.08	57	89.04	
1033	110	22.6	7.34	1135	1	4.05	56	89.04	
1035	120	22.6	7.37	1141	1	4.04	56	89.04	
1036	125	22.6	7.36	1147	1	4.04	54	89.05	

Chemets DO (mg/L): ______

	Method	Container Type/Volume	Preservative
Sample Analyses: →	8260B [MTBE + FREONS + ACETONE + TICs]	40 ml VOA	HCL
Sample Collection Method:	8270M [1,4-dioxane]	1L AB G	—

Pump: ☒ Flow Rate: 0.3 gpm	Sample ID. OC-GW-OW8b-082404	Sample Time: 1040
Bailer: ☐ Type: disposable	Duplicate ID:	Sample Time:
Other: ☐ Desc.:	Equip. blank ID:	Sample Time:

CDM MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-1	Site: C & I electric, Omega
Client: OPOG	Project No.: 10500-37240-T1.GW, SEMIANNUAL
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other: MS
Well Headspace: PID (ppm): 300 ppm	FID (ppm):
Sampler: Mike Hoffman & Mike Garcia	

Total Depth of Well (feet): 82.78 Reference Point: TOC Datum:

Depth to Water (feet): 76.97

Water Column Height (feet): 5.81 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 3.7 +22.00 (X) 3 = 772 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☑ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: 2" Grunfos Purge Equipment Decon'd? Y ☐ N ☐

Depth of Pump Intake (feet): 80' Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/Volume?

begin purge @ 1115 @ ~~0.5~~ 0.25 gpm

Time	Gallons	Temp. (C/ F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	ORP ~~Other~~	Observations/Comments DTW
1117	~~0.5~~ 0.25	20.2	6.80	2069	121		odor VOC
11:19	0.5	20.3	6.85	2150	100	-98	VOC odor 79.44'
1120	0.75	20.4	6.87	2142	97	-91	
1121	1	20.5	6.86	2140	98	-86	
1123	0.25	20.7	6.86	2146	111	-96	79.45
1124	0.5	20.9	6.83	2150	112	-84	
1126	0.75	21.6	6.88	2153	106	-86	
1128	2	22.0	6.83	2124	45	-66	79.46
1130	0.25	23.1	6.80	2102	24	-48	
1132	0.5	23.2	6.79	2084	17	-47	
1134	0.75	23.4	6.80	2064	11	-40	79.60
1136	Well	Dewatered	@	4 gallon			

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate:
Bailer: ☒ Type: DISP
Other: ☐ Desc.:

Sample ID: OC-GW-OW1-022404

Dup. ID (if appl.):

Sample Time:

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260 +	3 VOAs / 40 ml	HCl
1,4 Diox (8270)	Amber / 1L	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-1b	Site: Omega, Terra Pave	Date: 2/24/04
Client: OPOG	Project No.: 10500-37240-T1.GW.SEMIANNUAL	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other: MS	
Well Headspace:	PID (ppm): 12.4	FID (ppm):
Sampler: Mike ~~Hoffman~~ & Mike Garcia		

Total Depth of Well (feet): 116.53 Reference Point: TOC Datum: ______

Depth to Water (feet): (80.93)

Water Column Height (feet): 37.6 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / ___" - ___ Gal/feet = 24.44 (X) 3 = 205.3 Minimum Purge Volume (Gallons)

+ 44.00

PURGE METHOD:

Submersible Pump [x] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: 2" Grundfos Purge Equipment Decon'd? Y [x] N [ ]

Depth of Pump Intake (feet): 117' Purge/Decon Water Containerized? Y [ ] N [ ] Container Type/Volume? Steel Drum / 55 gal

begin purge @ 0936 @ 0.5 gpm ~~0836~~

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments	DTW (ft)
0938	1	20.1	7.77	1198	123		-165		88.22
0956 ~~1016~~ ~~1026~~	10 ~~20~~	20.6	7.34	1548	67		-113	(↑ to 1.0 gpm)	93.73
1006	20	21.8	8.03	976	37		-195		104.20
1011	25	22.1	8.19	895	36		-207		109.00
1013	27	22.5	8.16	886	52		-199		112.16
1015	29	22.9	8.19	889	72		-182		113.11
1017	31	22.8	8.10	909	245		-160		114.08
1018 — Well Dewatered @ 32 gallons —									

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate: ______
Boiler: [x] Type: DISP
Other: [ ] Desc.: ______

Sample ID: OC-GW-OW1b-022404

Dup. ID (if appl.): ______

Sample Time: 12:25

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260 + Freons, TICs, Acetone, MTBE	3 VOAs / 40 ml	HCl
8270, 1,4 DIOX	Amber / 1L	—

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MONITORING WELL PURGE AND SAMPLING FORM

I:\PROJECTS\CAD\ MWPURGE 10/05/94 0:00:40 Camp Dresser & McKee

Well No.: OW-~~X~~2	Site: Omega, Putnam Ave	Date: 2/24/04
Client: OPOG	Project No.: 10500-37240-T1.GW.SEMIANNUAL	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other: MS	
Well Headspace: PID (ppm): 325	FID (ppm): ———	
Sampler: Mike Hoffman & Mike Garcia		

Total Depth of Well (feet): ~~82.81~~ 80.14 Reference Point: TOC Datum: ______

Depth to Water (feet): ~~106.35~~ 70.40

Water Column Height (feet): 9.74 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 Gal/feet = 6.3 (X) 3 = 129.9 Minimum Purge Volume (Gallons)

+ ~~33.00~~ 37.00

PURGE METHOD: ___ " - ___

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: 2" Grunfos Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 78' Purge/Decon Water Containerized? Y [ ] N [ ] Container Type/Volume? Steel Drum 55 gal

begin purge @ 1213 @ 3.0 gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments / DTW
1213	1	19.9	7.18	1577	5		-15	
1217	12	21.3	7.08	1437	7		534	
1221	24	21.3	6.96	1417	13		40	
1225	36	21.4	6.99	1420	20		42	(↓ to 2.0 gpm)
1231	48	21.1	6.96	1393	9		21	
1237	60	20.8	6.96	1385	27		74	
1243	72	21.1	7.01	1392	5		32	- Well Dewatered -
1254	84	21.1	6.93	1393	16		76	74.28
1300	96	21.4	7.04	1404	7		40	
1306	108	21.3	6.99	1391	5		48	76.12
1312	120	21.3	7.07	1394	17		102	76.50
1317	130	21.6	7.00	1394	16		61	

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate: ______
Bailer: [X] Type: DISP.
Other: [ ] Desc.: ______

Sample ID: OC-GW-OW2-022404

Dup. ID (if appl.): ______

Sample Time: 11:00

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260 +	3 VOAs / 40ml	HCl
1,4 Diox (8270)	Amber / 1L	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-3	Site: Omega	Date: 2/25/04
Client: OPOG	Project No. 10500-37240-TI.GW.SEMIANNUAL	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace	PID (ppm): 325	FID (ppm):
Sampler: Mike Hoffman & Mike Garcia		

Total Depth of Well (feet): 82.81 Reference Point: TOC Datum:

Depth to Water (feet). 66.35

Water Column Height (feet): 16.46 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 10.69 (X) 3 = 131.07 Minimum Purge Volume (Gallons)

+ 33.00

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: 2" Grunfos Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 82.' Purge/Decon Water Containerized? Y [ ] N [ ] Container Type/Volume? Steel Drum / 55 gal

begin purge @ 0723 @ 2.0 gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments	DTW (ft)
0723	1	20.5	6.67	1546	36		140		68.94
0730	14	20.9	6.61	1570	15		164		70.68
0737	28	20.1	6.93	1541	16		97		72.70
0744	42	20.8	6.90	1532	52		131		76.31
0751	56	20.0	7.00	1962	73		137	(↓ to 1.5 gpm)	77.31
0800	70	20.4	6.91	2247	20		129		77.06
0809	84	19.8	6.99	1776	14		101		76.32
0819	98	20.7	6.88	1584	6		58		76.00
0828	112	20.7	6.86	1536	8		94		75.66
0837	126	21.1	6.96	1541	6		43		75.64
0841	132	21.3	6.91	1531	8		31		75.60

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate:
Bailer: [X] Type: DISP
Other: [ ] Desc.:

Sample ID: OC-GW-OW3-022404
Dup. ID (if appl.): OC-GW-OW3K-022404
Sample Time: 8:45 / 9:00

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260 +	3 VOAs / 40 ml	HCl
1H Diox (8270)	Amber / 1L	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-4A	Site: Omega	Date: 2/27/04
Client: OPOG	Project No.: 10500-37240-T7.GW.SEMIANNUAL	
Well Casing Diameter: 2" (4") 6" Other:	Well Casing Material: PVC (SS) Other:	
Well Headspace:	PID (ppm): 2.4	FID (ppm):
Sampler: Mike Hoffman & Mike Garcia		

Total Depth of Well (feet): 74.73 Reference Point: TOC Datum: ______

Depth to Water (feet): (61.04)

Water Column Height (feet): 13.69 (X) 2" - 0.16 / (4" - 0.65) / 6" - 1.47 / __" - __ Gal/feet = 8.8 (X) 3 = 101.6 Minimum Purge Volume (Gallons)

+25.0

PURGE METHOD:

Submersible Pump ☒ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: 2" Grunfos Purge Equipment Decon'd? Y ☒ N ☐

Depth of Pump Intake (feet): 73' Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/Volume? Steel Drum / 55 gal

begin purge @ 0855 @ 5.0 gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments DTW (ft.)
0855	2	20.6	7.09	1554	39		78	
0857	~~10~~ 12	21.5	6.94	1396	51		65	
0859	22	21.9	6.94	1383	42		73	
0901	32	22.1	6.88	1368	34		104	
0903	42	21.9	6.88	1360	20		93	
0905	52	21.8	6.93	1366	11		86	62.13
0907	62	21.8	6.91	1367	7		80	62.13
0909	72	21.7	6.91	1359	5		75	62.13
0911	82	21.6	6.87	1353	2		138	
0913	92	21.9	6.85	1363	2		139	62.13
0915	102	21.3	6.96	1360	1		107	62.13

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ______

Bailer: ☒ Type: DISP

Other: ☐ Desc.: ______

Sample ID: OC-GW-OW4A-022704

Dup. ID (if appl.): ______

Sample Time: 9:30

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260+	3 VOAs / 40 ml	HCl
1,4 Diox (8270)	Amber / 1L	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-4B	Site: Omega	Date: 2/27/04
Client: OPOG	Project No.: 10500-37240-T1.GW.SEMIANNUAL	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace: PID (ppm): 1.9	FID (ppm):	
Sampler: Mike Hoffman & Mike Garcia		

Total Depth of Well (feet): 126.82 Reference Point: TOC Datum: ______

Depth to Water (feet): (68.08)

Water Column Height (feet): 58.74 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 38.1 (X) 3 = 2045 Minimum Purge Volume (Gallons)

+ 30.00

PURGE METHOD:

Submersible Pump ☒ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: 2" Grunfos Purge Equipment Decon'd? Y ☒ N ☐

Depth of Pump Intake (feet): 126' Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/Volume? Steel Drum 55 gal

begin purge @ 0743 @ 5.0 gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs):	DO (ppm)	Eh (mV)	Observations/Comments	DTW (ft)
0743	1	19.0	6.67	1437	28		112	odor	68.10
0747	20	20.4	7.10	1451	14		42		71.02
0751	40	21.2	7.09	1465	9		54		71.33
0755	60	20.5	7.25	1469	6		22		71.75
0759	80	20.9	7.15	1480	5		34		71.97
0803	100	20.4	7.23	1479	5		31		72.04
0807	120	21.0	7.24	1492	4		32		72.14
0811	140	21.0	7.23	1490	4		35		72.17
0815	160	20.8	7.22	1484	4		73		72.17
0819	180	21.1	7.31	1483	3		47		72.17
0823	200	20.7	7.31	1478	3		64		72.18
0827 ~~0824~~	210 ~~205~~	21.4	7.27	1494	3		59		72.18

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ______

Bailer: ☒ Type: DISP

Other: ☐ Desc.: ______

Sample ID: OC-GW-OW4B-022704

Dup. ID (if appl.): ______

Sample Time: 8:30

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260+	3 VOAs / 40 ml	HCl
1H Diox (8270)	Amber / 1L	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-5	Site: Omega	Date: 2/24/04
Client: OPOG	Project No.: 10500-37240-T1.GW.SEMIANNUAL	
Well Casing Diameter: 2" (4") 6" Other:	Well Casing Material: PVC (SS) Other:	
Well Headspace:	PID (ppm):	FID (ppm):
Sampler: Mike Hoffman & Mike Garcia		

Total Depth of Well (feet): 49.75 Reference Point: TOC Datum: ______

Depth to Water (feet): 35.21

Water Column Height (feet): 14.54 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 Gal/feet = 9.45 + 28.00 = 37.45 (X) 3 = 112.3 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☒ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: 2" Grunfos Purge Equipment Decon'd? Y ☒ N ☐

Depth of Pump Intake (feet): Bottom Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/Volume? Steel Drum 55 gal

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	DTW Observations/Comments
14:48	1	19.9	7.12	1448	>1000		26	35.49
14:50	10	21.0	7.14	1471	148		Ø	
14:52	20	20.8	7.13	1473	130		531	35.50
14:54	30	21.6	7.06	1476	138		531	
14:56	40	21.2	7.27	1427	91		522	35.51
14:58	50	21.4	7.09	1473	81		527	
15:00	60	21.4	7.03	1455	61		8	35.51
15:02	70	21.6	7.02	1471	54		1	
15:04	80	21.5	7.01	1474	51		534	35.51
15:06	90	21.5	7.03	1482	44		531 ~~42~~	
15:08	100	21.6	7.00	1445	44		42	
15:~~10~~09	113	21.6	7.01	1449	32		26	35.51

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ______
Bailer: ☒ Type: DISP
Other: ☐ Desc.: ______

Sample ID: OC-GW-OW5-022404

Dup. ID (if appl.): ______

Sample Time: 15:25

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260+	3 VOAs / 40ml	HCL
1H Diox (8270)	Amber / 1L	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-6	Site: Omega	Date: 2/25/04
Client: OPOG	Project No.: 10500-37240-T1.GW.SEMIANNUAL	
Well Casing Diameter: 2" (4") 6" Other:	Well Casing Material: PVC (SS) Other:	
Well Headspace:	PID (ppm): 16	FID (ppm):
Sampler: Mike Hoffman & Mike Garcia		

Total Depth of Well (feet): 58.44 Reference Point: TOC Datum:

Depth to Water (feet): (50.24)

Water Column Height (feet): 8.20 (X) 2" - 0.16 / (4" - 0.65) / 6" - 1.47 / __" - __ Gal/feet = 5.33 (X) 3 = 90.99 Minimum Purge Volume (Gallons)

+25.00

PURGE METHOD:

Submersible Pump ☑ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: 2" Grunfos Purge Equipment Decon'd? Y ☒ N ☐

Depth of Pump Intake (feet): 56' Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/Volume? Steel Drum 55 gal

begin purge @ 1135 @ 5.0 gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments DTW (ft.)
1135	1	20.4	7.06	1807	2		74	
1137	10	21.3	6.93	1842	<10		79	
1139	20	21.7	6.96	1860	0.4		74	
1141	30	21.6	6.97	1866	0.5		72	50.45
1143	40	21.6	6.96	1863	1.7		69	
1145	50	21.5	6.94	1860	0.7		121	50.46
1147	60	21.7	6.90	1861	0.1		162	
1149	70	21.4	6.95	1862	0.04		131	50.46
1151	80	21.6	6.87	1863	0.59		190	
1153	91	21.7	6.88	1863	1.9		179	50.46

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate:
Bailer: ☒ Type: DISP
Other: ☐ Desc.:

Sample ID: OC-GW-OW6-022504
Dup. ID (if appl.):
Sample Time: 12:00

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260+	3 VOAs / 40 ml	HCl
1H Diox (8270)	Amber / 1L	—

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MONITORING WELL PURGE AND SAMPLING FORM

Camp Dresser & McKee

Well No.: OW-7	Site: Omega	Date: 2/25/04
Client: OPOG	Project No.: 10500-37240-TI.GW.SEMIANNUAL	
Well Casing Diameter: 2" **4"** 6" Other:	Well Casing Material: PVC **SS** Other:	
Well Headspace.	PID (ppm):	FID (ppm):
Sampler: Mike Hoffman & Mike Garcia		

Total Depth of Well (feet): 89.45 Reference Point: TOC Datum: ______

Depth to Water (feet): 78.00

Water Column Height (feet): 11.45 (X) 2" - 0.16 / **4" - 0.65** / 6" - 1.47 / __" - __ Gal/feet = 7.44 (X) 3 = 109.3 Minimum Purge Volume (Gallons)

+ 29.00

PURGE METHOD:

Submersible Pump ☑ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: 2" Grunfos Purge Equipment Decon'd? Y ☒ N ☐

Depth of Pump Intake (feet): 88' Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/Volume? Steel Drum 55 gal

begin purge @ 0920 @ 1.0 gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments	DTW (ft.)
0921	1	19.2	7.31	1544	318		111		79.40
0931	11	20.7	7.06	1580	53		95		80.29
0942	22	20.9	6.91	1559	16		90		80.81
0953	33	20.8	6.91	1555	11		94		81.00
1004	44	20.9	6.82	1547	6		142		81.01
1015	55	20.3	7.08	1542	2		77		81.01
1022	66	20.7	7.00	1546	2		78	(↑ to 1.5 gpm)	81.82
1029	77	21.2	6.97	1555	4		84		82.52
1037	88	21.1	6.96	1551	4		80		83.12
1044	99	20.9	6.94	1544	5		100		83.47
1051	110	21.4	6.97	1550	5		98		83.64

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ______

Bailer: ☒ Type: DISP

Other: ☐ Desc.: ______

Sample ID: OC-GW-OW7-022504

Dup. ID (if appl.): ______

Sample Time: ______

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260+	3 VOAs / 40ml	HCl
1,4 Diox (8270)	Amber / 1L	—

Well No.: OW-8	Site: Omega, Putnam Ave	Date: 2/24/04
Client: OPOG	Project No.: 10500-37240-T1.GW.SEMIANNUAL	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm): 13.5	FID (ppm): —
Sampler: Mike Hoffman & Mike Garcia (Blaine Tech)		

Total Depth of Well (feet): 79.55 Reference Point: TOC Datum:

Depth to Water (feet): 68.36

Water Column Height (feet): 11.19 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 Gal/feet = 7.27 (X) 3 = 105.82 Minimum Purge Volume (Gallons)

+ 28.00 (gravel pack)

PURGE METHOD:

___" - ___

Submersible Pump [x] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: 2" Grundfos Purge Equipment Decon'd? Y [ ] N [ ]

Depth of Pump Intake (feet): 77' Purge/Decon Water Containerized? Y [ ] N [ ] Container Type/Volume?

begin purge @ 0815 @ 3 gpm

Time	Gallons	Temp. (C)/(F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments	DTW (ft.)
0819	12	69.2 (F)	6.51	1972	3			odor	
0823	24	21.1	6.43	1924	2				68.94
0827	36	21.3	6.66	1902	1		-91		68.94
0831	48	21.3	6.67	1902	2		-93		
0835	60	21.3	6.72	1953	1		-94		68.95
0839	72	21.4	6.66	1968	1		-74		
0843	84	21.4	6.71	1989	1		-76		68.97
0847	96	21.2	6.62	2021	1		-56		
0851	108	21.3	6.64	2011	1		-67		69.00

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate:
Bailer: [x] Type: DSP
Other: [ ] Desc.:

Sample ID: OC-GW-OW8-022404

Dup. ID (if appl.):

Sample Time: 0900

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260	3 Voas / 40 ml	HCl
+ Acetone, MTBE, Freons, & TICS		
8270 (1,4 Dioxane)	1 1L amber	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-1	Site: Omega	Date: 8/26/03
Client: OPOG	Project No.: 10500-37240-T1.GW.SEMIANNUAL	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm): —	FID (ppm):
Sampler: MP & MH		

Total Depth of Well (feet): 82.60 Reference Point: TOC Datum:

Depth to Water (feet): (76.95)

Water Column Height (feet): ~~3.67~~ 5.65 (X) 2" - 0.16 / ~~4~~4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 3.67 (X) 3 = 77.0 Minimum Purge Volume (Gallons)

22.00

25.67

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: 2" Grunfos Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 80 Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? Steel Drum 55 gal

.5 gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1017	1	77.8	6.8	1775	112	0.46	-108	DTW=79.25 Started @ 1017
1022	3	77.9	6.8	1808	73	0.46	-83	DTW = 80.20
1027	6	78.5	6.8	1744	35	0.47	-49	DTW = 82.15

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate:
Bailer: [X] Type: DISP
Other: [ ] Desc.:

Sample ID: OC-GW-OW1-082603

Dup. ID (if appl.):

Sample Time: 14:20

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 VOAs	HCl
8270(1,4 Dioxane)	2-1L ambers	

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MONITORING WELL PURGE AND SAMPLING FORM

I:\PROJECTS\ S:\CAD\ MWPURGE 10/05/94 0:00:40 Camp Dresser & McKee

Well No.: OW-1b	Site: Omega Chemical	Date: 8-26-03
Client: OPOG	Project No.: 10500-37240-T1, GW, SEMIANNUAL	
Well Casing Diameter: 2" 4 6" Other: —	Well Casing Material: PVC SS Other: MS	
Well Headspace: PID (ppm):	FID (ppm):	
Sampler: MP		

Total Depth of Well (feet): 118.45 Reference Point: TOC Datum: ____

Depth to Water (feet): (78.75)

Water Column Height (feet): 39.7 (X) 2" - 0.16 / *4" - 0.65 / 6" - 1.47 Gal/feet = 25.80 (X) 3 = 209.4 Minimum Purge Volume (Gallons)

44.00

69.80

PURGE METHOD: __ " - __

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [✓]

Pump Make/Model: 2" Grunfos Purge Equipment Decon'd? Y [ ] N [ ]

Depth of Pump Intake (feet): 117 Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? Steel Drum 55 gal

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
0843	1	73.6	7.3	1000	77	.31	-159	DTW 93.12 Start pump @ 1 gpm
0852	10	73.5	7.7	955.3	98	.22	-201	DTW - 95.66
0857	15	73.9	7.8	944.3	118	.20	-197	DTW - 96.9d 1000 mLpm
0903	~~20~~ 17	74.3	7.8	951.0	159	.20	-206	DTW = 98.22
0912	~~22~~ 19	74.7	7.6	1055	>1000	.26	-158	DTW = 104.00
0918	21	74.5	7.8	985.0	396	.17	-188	DTW = 106.59 .5 gpm
0923	23	75.8	7.7	1008	319	.30	-157	DTW = 108.20
0928	25	76.0	7.5	1023	308	.36	-149	DTW = 109.40

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate:
Bailer: [X] Type: Disp
Other: [ ] Desc.:

Sample ID: OCGW-OW1b-082603

Dup. ID (if appl.):

Sample Time: 15:30

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8270 (1,4 Dioxane)	1 1L amber	—
8260B	3 VOAs	HCl

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-2	Site: Omega Chemical	Date: 8-27-03
Client: OPOG	Project No.: 10500-37240-TL.GW.SEMI ANNUAL	
Well Casing Diameter: 2" (4) 6" Other:	Well Casing Material: PVC (SS) Other: MS	
Well Headspace:	PID (ppm): —	FID (ppm):
Sampler: mp & Mike Hoffman		

Total Depth of Well (feet): 80.00 Reference Point: TOC Datum:

Depth to Water (feet): (69.18)

Water Column Height (feet): 10.82 (X) 2" - 0.16 / ✗4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 7.03 + 37.00 = 44.03 (X) 3 = 132.09 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☒ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☑

Pump Make/Model: 2 Grundfos Purge Equipment Decon'd? Y ☑ N ☐

Depth of Pump Intake (feet): 78' Purge/Decon Water Containerized? Y ☑ N ☐ Container Type/Volume? Steel Drum 55 gal

2 gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1000	1	72.7	7.3	1395	10	1.13	125	Started @ 1000
1007	14	72.6	7.1	1378	4	2.75	82	DTW = 71.85
1014	28	72.5	7.0	1375	3	3.18	96	DTW = 72.00
1021	42	72.6	7.0	1370	2	3.38	76	DTW = 72.00
1028	56	72.8	7.0	1371	2	3.49	100	DTW = 72.14
1035	70	72.8	7.0	1368	2	3.55	163	DTW = 72.20
1042	84	72.7	6.9	1371	2	3.58	122	DTW = 72.25
1049	98	73.7	7.0	1376	2	3.61	207	DTW = 72.35
1056	112	73.7	6.9	1373	2	3.65	198	DTW = 72.45
1103	126	73.7	7.0	1373	2	3.67	150	DTW = 72.46
1110	140	74.1	7.0	1360	1	3.67	139	DTW = 72.50

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate:
Bailer: ☑ Type: ~~DSP~~
Other: ☐ Desc.:

Sample ID: OC-GW-OW2-082703

Dup. ID (if appl.):

Sample Time: 11:45

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 VOAs	HCl
8270 (1,4 Dioxane)	1 1L amber	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-3	Site: Omega Chem, Putnam Ave	Date: 8-26-03
Client: OPOG	Project No.: 10500-37240-T7.GW SEMIANNUAL	
Well Casing Diameter: 2" (4") 6" Other:	Well Casing Material: PVC SS Other: MS	
Well Headspace:	PID (ppm): →	FID (ppm):
Sampler: Mike Hoffman & Mike Palm		

Total Depth of Well (feet): 82.85 Reference Point: TOC Datum:

Depth to Water (feet): 65.54

Water Column Height (feet): 17.31 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 26.63 (X) 3 = 178.8 Minimum Purge Volume (Gallons)

33.00 Gravel Pack

59.63

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [X]

Pump Make/Model: 2" Grundfos Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): bottom Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? Steel Drum 55 gal

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1120	1	77.0	7.3	1488	49	0.62	25	Started @ 1120 2gpm
1125	10	75.1	7.1	1488	29	2.32	10	DTW=
1130	20	74.9	7.0	1485	12	3.49	34	
1135	30	74.5	7.0	1485	8	3.80	77	
1140	40	73.9	7.0	1483	6	4.19	101	DTW=70.80
1145	50	73.8	6.9	1488	8	4.43	83	DTW= 71.19
1150	60	73.8	6.9	1492	8	4.52	82	DTW= 71.50
1155	70	73.6	6.9	1489	6	4.55	81	DTW= 71.85
1200	80	73.7	6.9	1488	9	4.59	80	DTW= 72.12
1205	90	73.6	6.9	1485	9	4.65	80	DTW= 72.35
1210	100	73.5	6.9	1484	8	4.58	81	DTW= 72.65
1220	120	74.5	6.9	1486	6	4.63	79	DTW = 72.91

Continued Next Page

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate:
Bailer: [X] Type: DISP
Other: [ ] Desc.:

Sample ID: OC-GW-OW3-082603
Dup. ID (if appl.):
Sample Time: 13:10

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 VOAs	HCl
8270 (1,4 Dioxane)	1L amber	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-3	Site:	Date: 8/26/03
Client:	Project No.:	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm):	FID (ppm):
Sampler:		

Total Depth of Well (feet): ________ Reference Point: ________ Datum: ________

Depth to Water (feet): ________

Water Column Height (feet): ________ (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = ________ (X) 3 = ________ Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☐ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: ________ Purge Equipment Decon'd? Y ☐ N ☐

Depth of Pump Intake (feet): ________ Purge/Decon Water Containerized? Y ☐ N ☐ Container Type/Volume? ________

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1230	140	74.9	6.9	1485	6	4.68	79	DTW= 73.10
1240	160	74.3	6.9	1492	3	4.70	74	DTW= 73.35
1250	180	75.2	6.9	1483	3	4.68	73	DTW= 73.50

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ________
Bailer: ☒ Type: DISP
Other: ☐ Desc.: ________

Sample ID: OC-GW-OW3-082603

Dup. ID (if appl.): ________

Sample Time: 13:10

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260	3 VOAs	HCl
8270 (1,4 Dioxane)	1L amber	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-4A	Site: Omega, WA Blvd	Date: 8 27 03
Client: OPOG	Project No.: 10500-37240-TI.GW. SEMIANNUAL	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other: MS	
Well Headspace: PID (ppm): —	FID (ppm): —	
Sampler: mp B mH		

Total Depth of Well (feet): 75.75 Reference Point: TOC Datum:

Depth to Water (feet): (58.13)

Water Column Height (feet): 16.62 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / — " - — Gal/feet = 10.80 (X) 3 = 107.4 Minimum Purge Volume (Gallons)

25.00
35.80

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [X]

Pump Make/Model: 2" Grundfos Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 73.00 Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? Drum 55 gal

Started @ 5gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1500	1	77.4	7.1	1772	25	0.72	148	started @ 1500
1502	10	75.6	7.0	1650	26	1.53	178	DTW = 58.72
1504	20	75.8	7.0	1630	20	1.99	121	DTW = 58.76
1506	30	74.8	6.9	1595	20	2.22	90	DTW = 58.77
1508	40	75.3	7.0	1569	18	2.45	103	DTW = 58.77
1510	50	74.5	6.9	1518	8	2.70	125	DTW = 58.77
1512	60	74.3	6.9	1501	9	2.97	105	DTW = 58.75
1514	70	74.6	6.9	1501	8	3.06	123	DTW = 58.77
1516	80	74.3	6.9	1490	5	3.11	102	DTW = 58.77
1518	90	74.2	6.9	1456	2	3.25	118	DTW = 58.77
1520	100	73.9	6.9	1464	2	3.29	114	DTW = 58.77
1522	110	73.8	7.0	1460	2	3.31	110	DTW = 58.78

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate:
Bailer: [X] Type: DISP
Other: [ ] Desc.:

Sample ID: OC-GW-OW4A-082703

Dup. ID (if appl.):

Sample Time: 15:35

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 VOAs	HCl
8270 (1,4 Dioxane)	1L Amber	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-4B	Site: Omega, WA Blvd	Date: 8/27/03
Client: OPOG	Project No.: 10500-37240-T1.GW.SEMIANNUAL	
Well Casing Diameter: 2" (4") 6" Other:	Well Casing Material: PVC (SS) Other: MS	
Well Headspace:	PID (ppm): —	FID (ppm): —
Sampler: Mike Palm, Mike Hoffman		

Total Depth of Well (feet): 128.98 Reference Point: TOC Datum:

Depth to Water (feet): (65.67)

Water Column Height (feet): 63.31 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 41.15 (X) 3 = 213.4 Minimum Purge Volume (Gallons)

30.00

71.15

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [X]

Pump Make/Model: 2" Grunfos Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 126' Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? Steel Drum 55 gal

5 gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1329	1	78.5	7.3	1370	11	2.85	-41	Started @ 1329
1333	20	77.2	7.1	1401	15	2.77	-21	DTW = 68.50
1337	40	75.0	7.2	1429	8	2.91	2	DTW - 68.60
1341	60	76.1	7.1	1459	3	2.98	31	DTW = 68.66
1345	80	74.7	7.3	1456	3	2.99	34	DTW = 68.67
1349	100	74.5	7.3	1454	3	2.99	57	DTW = 68.74
1353	120	74.7	7.2	1454	2	2.99	56	DTW = 68.76
1357	140	74.8	7.3	1456	2	2.99	54	DTW = 68.76
1401	160	74.3	7.1	1468	2	3.01	55	DTW = 68.76
1405	180	74.4	7.2	1458	2	3.02	60	DTW = 68.77
1409	200	73.9	7.2	1456	1	3.02	53	DTW = 68.94
1413	220	74.0	7.3	1455	1	3.03	58	DTW = 68.97

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate:
Bailer: [X] Type: DSP
Other: [ ] Desc.:

Sample ID: OC-GW-OW4B-082703

Dup. ID (if appl.):

Sample Time: 15:35

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 VOAs	HCl
8270 (1,4 Dioxane)	1 1L amber	—

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MONITORING WELL PURGE AND SAMPLING FORM

I:\PROJECTS\ .S\CAD\ MWPURGE 10/05/94 0:00:40

Camp Dresser & McKee

Well No.: OW-5	Site: Omega Chemical, Rivera	Date: 8-28-03
Client: OPOG	Project No.:	
Well Casing Diameter: 2" (4") 6" Other:	Well Casing Material: PVC (SS) Other: MS	
Well Headspace:	PID (ppm): ———	FID (ppm): ———
Sampler: Mike Palm, Mike Hoffman		

Total Depth of Well (feet): 49.85 Reference Point: TOC Datum: _____

Depth to Water (feet): 31.20

Water Column Height (feet): 18.65 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 12.12 (X) 3 = 120.36 Minimum Purge Volume (Gallons)

12.12
28.00
40.12

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [X]

Pump Make/Model: 2" Grundfos Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 48.00 Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? Drum 55 gal

5 gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
0805	1	71.9	6.6	1358	265	2.95	107	Started @0805
0807	12	71.8	6.7	1324	120	2.33	72	DTW= 31.55
0809	24	71.8	6.8	1323	74	2.47	67	DTW= 31.55
0811	36	71.8	6.8	1323	60	2.56	64	DTW= 31.55
0813	48	71.7	6.8	1330	31	2.69	63	DTW= 31.55
0815	60	71.6	6.8	1331	15	2.82	61	DTW= 31.55
0817	72	71.7	6.9	1335	10	2.95	58	DTW= 31.55
0819	84	71.6	6.8	1338	8	3.01	58	DTW= 31.55
0821	96	71.7	6.8	1339	6	3.09	56	DTW= 31.57
0823	108	71.7	6.8	1329	3	3.18	60	DTW= 31.57
0826	121	71.7	6.9	1347	2	3.21	64	DTW= 31.57

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate: _____
Bailer: [X] Type: DISP
Other: [ ] Desc.: _____

Sample ID: OC-GW-OW5-082803

Dup. ID (if appl.): _____

Sample Time: 8:45

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260	9 VOAS	HCl
8270(1,4 Dioxane)	3 1L ambers	———

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MONITORING WELL PURGE AND SAMPLING FORM

Camp Dresser & McKee 10/05/94 0:00:40 I:\PROJECTS\IS\CAD\MWPURGE

Well No.: OW-6	Site: Omega, Lambert Ave	Date: 8/28/03
Client: OPOG	Project No.: 10500-37240-T1.GW SEMIANNUAL	
Well Casing Diameter: 2" (4") 6" Other:	Well Casing Material: PVC (SS) Other: MS	
Well Headspace. PID (ppm). —	FID (ppm): —	
Sampler: Mike Palm, Mike Hoffman		

Total Depth of Well (feet): 58.45 Reference Point: TOC Datum: ______

Depth to Water (feet): (47.09)

Water Column Height (feet): 11.36 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / ___" - ___ Gal/feet = 7.38 + 25.00 = 32.38 (X) 3 = 97.15 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [X]

Pump Make/Model: 2" Grund Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 46" Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? Drum 55 gal

5 gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
0943	1	72.8	6.9	1780	4	1.15	220	Started @ 0943
0945	10	72.5	6.8	1781	4	.65	207	DTW= 47.27
0947	20	72.3	6.8	1775	2	.62	191	DTW= 47.27
0949	30	72.2	6.8	1777	2	.62	148	DTW= 4727
0951	40	72.2	6.8	1775	2	.61	131	DTW= 47.27
0953	50	72.2	6.8	1776	1	.61	117	DTW= 47.27
0955	60	72.1	6.8	1776	1	.72	112	DTW= 47.27
0957	70	72.1	6.8	1776	1	.68	115	DTW= 47.27
0959	80	72.1	6.8	1777	1	.66	117	DTW= 47.27
1001	90	72.1	6.9	1777	1	.63	124	DTW= 47.27
1003	100	72.1	6.9	1778	1	.62	125	DTW= 47.27

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate: ______

Bailer: [X] Type: Disp

Other: [ ] Desc.: ______

Sample ID: OGW-OW6-082803

Dup. ID (if appl.): ______

Sample Time: ______

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 VOAs	HCl
8270(1,4 Dioxane)	1L amber	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-7	Site: Omega Chemical, Whittier Blvd	Date: 8/26/03
Client: OPOG	Project No.: 10500-37240-TI.GW.SEMIANNUAL	

Well Casing Diameter: 2" 4" 6" Other:
Well Casing Material: PVC SS Other: MS.

Well Headspace: PID (ppm): FID (ppm):

Sampler: Mike Hoffman & Mike Palm

Total Depth of Well (feet): 89.50
Reference Point: TOC
Datum:
Depth to Water (feet): 76.90

Water Column Height (feet): 12.6 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 Gal/feet = 8.19 29.00 (X) 3 = ~~37.19~~ 111.57 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

___" - ___

Pump Make/Model: 2" GrunFos
Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 88
Purge/Decon Water Containerized? Y [X] N [ ]
Container Type/Volume? Steel Drum 55 gal

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1409	1	78.8	7.3	1499	5	1.08	107	Started @ 1409
1419	10	80.9	7.3	1479	3	2.76	106	
1427	20	79.6	7.2	1501	3	3.26	106	
1439	30	77.8	7.1	1515	5	4.25	78	
1449	40	81.6	7.0	1504	5	4.33	116	
1459	50	82.2	7.0	1492	3	4.31	137	
1509	60	78.3	6.9	1542	3	4.44	136	
1519	70	81.8	7.2	1514	2	4.53	150	
1529	80	79.2	7.0	1510	2	4.60	168	
1539	90	77.7	7.0	1498	2	4.74	163	
1549	100	76.3	6.9	1507	2	4.65	152	
1602	112	76.8	7.0	154	3	4.59	148	

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate:
Bailer: [X] Type: DISP
Other: [ ] Desc.:

Sample ID: OC-GW-OW7-082603
Dup. ID (if appl.):
Sample Time: 16:20

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 VOAs	HCl
8270 (1,4 Dioxane)	1L amber	—

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-8	Site: Omega Chemical	Date: 8-27-03
Client: OPOG	Project No.: 10500-37240-T1.GW.SEMIANNUAL	
Well Casing Diameter: 2" (4") 6" Other:	Well Casing Material: PVC SS Other: MS	
Well Headspace: PID (ppm): —	FID (ppm):	
Sampler: Mike Palin		

Total Depth of Well (feet): 79.55 Reference Point: TOC Datum:

Depth to Water (feet): (67.35)

Water Column Height (feet): 12.20 (X) 2" - 0.16 / *4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 7.93 + 28.00 = 35.93 (X) 3 = 107.79 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [✓]

Pump Make/Model: 2 Grundfos Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 77.00 Purge/Decon Water Containerized? Y [X] N [ ] Container Type/ Volume? Steel Drum 55 gal

3 gpm

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
0759	1	72.7	6.5	1757	50	0.86	-61	Started @ 0759
0803	12	72.1	6.8	1590	13	1.72	-63	DTW = 67.95
0807	24	72.1	6.8	1587	8	1.75	-61	DTW = 67.95
0811	36	71.9	6.8	1599	5	1.81	-60	DTW = 67.95
0815	48	71.9	6.8	1611	7	1.80	-61	DTW = 67.95
0819	60	71.8	6.8	1618	5	1.79	-53	DTW = 68.00
0823	72	71.8	6.8	1626	5	1.79	-57	DTW = 68.00
0827	84	71.8	6.8	1637	4	1.80	-58	DTW = 68.05
0831	96	71.8	6.8	1652	3	1.80	-53	DTW = 68.05
0835	108	71.7	6.8	1659	3	1.81	-52	DTW = 68.05

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate:
Bailer: [X] Type: Disp
Other: [ ] Desc.:

Sample ID: OC-GW-OW8-082703
Dup. ID (if appl.): " -OW8K- "
Sample Time: 8:50

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	6 VOAS	HCl
8270 (1,4 Dioxane)	2 1L ambers	—

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MONITORING WELL PURGE AND SAMPLING FORM

I:\PROJECTS\ .S\CAD\ MWPURGE 10/05/94 0:00:40 Camp Dresser & McKee

Well No.: OW - 1	Site: Omega Chemical	Date: 2/19/03
Client: OPOG	Project No.:	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC ~~SS~~ Other: MS	
Well Headspace:	PID (ppm): 340	FID (ppm):
Sampler: Ros P., mike Hoffman, Trei Chatman		

Total Depth of Well (feet): 82.72 Reference Point: ______ Datum: ______

Depth to Water (feet): 76.70

Water Column Height (feet): 6.02 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 3.91 (X) 3 = 12 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☑ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Boiler: PVC ☐ Teflon ☐ SS ☐ Disposable ☑

Pump Make/Model: 2" Grundfos Purge Equipment Decon'd? Y ☑ N ☐

Depth of Pump Intake (feet): ~~bottom~~ 80' Purge/Decon Water Containerized? Y ☑ N ☐ Container Type/Volume? ______

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1312	~~3~~					~~0.30~~	~~-32.9~~	START PUMP
								@ 0.5 GPM
1318	3	72.4	6.89	1682	57	0.30	-32.9	CLEAR
1320	4							STOP PUMP
1331	5	72.7	6.81	1706	1000	0.31	-58.3	DTW = 79.5 / TURBID
1335	6	74.5	6.80	1646	1000	0.46	-36.1	SLOWED PUMP TO 0.25 GPM. lowered pump to bottom
1339	7	74.4	6.79	1632	91	0.37	-21.2	CLEAR / 0.0 0.4 mg/L chemets
1348	9	74.5	6.74	1632	51	0.40	-16.4	CLEAR
1356	11	74.1	6.77	1629	29	0.42	-19.4	CLEAR
1400	12	74.9	6.73	1629	12	0.44	-15.8	CLEAR DTW = 80.13

start purge from bottom

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate:

Bailer: ☑ Type: disposable

Other: ☐ Desc.:

Sample ID: OC-GW-OW1-021903

Dup. ID (if appl.): —

Sample Time: 14:15

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 VOA	HCl
1,4-dioxane	1 L Amber	—
perchlorate/NO_3^-/NO_2^-	500 mL poly	—
CH_4, C_2H_6, C_2H_4	2 VOA	—
DOC	2 VOA	—
MNA/ Alkalinity, H_2S, CO_2, SO_4^{2-}, Cl^-	500 mL poly	—
Fe^{+2}	Cup - field filtered	—
C-H6	500 mL poly	NaOH

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW – 1B	Site: Omega Chemical	Date: 2/19/03
Client: OPOG	Project No.: 10500 --	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other: MS	
Well Headspace: PID (ppm): ∅	FID (ppm):	
Sampler: MH & TC		

Total Depth of Well (feet): 118.54 Reference Point: TOC Datum:

Depth to Water (feet): 77.04

Water Column Height (feet): 41.5 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 Gal/feet = 26.97 (X) 3 = 81 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☒ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☑

Pump Make/Model: 2" Grunfos Purge Equipment Decon'd? Y ☒ N ☐

Depth of Pump Intake (feet): bottom Purge/Decon Water Containerized? Y ☒ N ☐ Container Type/Volume? Steel Drum 55 gal

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
936								START PUMP @ 0.5 GPM
946	5	68.4	7.2	1016	594	0.39	-147.0	DTW = 82.56
956	10	69.4	7.4	969.8	177	0.19	-239.2	DTW = 86.79
1000	12	71.0	7.4	992.0	114	0.16	-248.8	DTW = 89.28
1002	13							STOP PUMP
1019	14	70.2	7.3	1067	>1000	0.17	-173.4	DTW = 89.27
1023	16	69.9	7.3	1066	832	0.15	-198.5	DTW = 91.90
1027	18	71.3	7.5	998.6	404	0.17	-209.1	DTW = 92.80 / D.O 0-2 mg/L Chemets
1037	23	71.6	7.5	993.4	200	0.13	-213.4	DTW = 96.25
1047	27	72.3	7.5	995.8	394	0.15	-201.8	DTW = 102.20
1057	32	72.8	7.6	1031	>1006	0.11	-202.9	DTW = 104.65

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate:
Bailer: ☒ Type: disposable
Other: ☐ Desc.:

Sample ID: OC-GW-OW1B-021903

Dup. ID (if appl.):

Sample Time: 16:30

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	VOA	HCl
1,4-dioxane	1 L Amber	—
perchlorate / NO_3/NO_2	500mL poly	—
CH_4 C_2H_6 C_2H_4	2 VOA	—
DOC	2 VOA	—
MNA (Alkalinity, H_2S, CO_2, SO_4^{2-}, Cl)	500mL poly	—
Fe²⁺	cup. field filtered	—
Cr⁶		NaOH

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW - 1B	Site: Omega Chemical	Date: 2/19/03
Client: OPOG	Project No.:	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other: MS	
Well Headspace:	PID (ppm): ∅	FID (ppm):
Sampler: MH + TC		

Total Depth of Well (feet): 118.54 Reference Point: TOC Datum: ______

Depth to Water (feet): 77.04

Water Column Height (feet): 41.5 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 26.97 (X) 3 = 81 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☑ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☑

Pump Make/Model: 2" Ground Fos Purge Equipment Decon'd? Y ☑ N ☐

Depth of Pump Intake (feet): ______ Purge/Decon Water Containerized? Y ☑ N ☐ Container Type/Volume? Steel Drum 55 gal

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1107	37	72.1	7.5	1030	433	0.25	-193.3	DTW = 108.39
1117	42	72.8	7.4	1041	179	0.28	-176.5	DTW = 111.25 / CLEARING
1127	47	72.7	7.4	1048	134	0.29	-179.2	DTW = 113.7
1137	52	72.9	7.4	1140	83	0.30	-151.0	DTW = 117.18
1138	WELL DEWATERED							
1620								DTW = 82.99

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ______

Bailer: ☐ Type: ______

Other: ☐ Desc.: ______

Sample ID: ______

Dup. ID (if appl.): ______

Sample Time: 16:30

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
see page 1		

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-2	Site: Omega Chemical	Date: 2/19/03
Client: OPOG	Project No.:	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm): 149	FID (ppm):
Sampler: MH + TC		

Total Depth of Well (feet): 80.34   Reference Point: ______   Datum: ______

Depth to Water (feet): 69.44

Water Column Height (feet): 10.9 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 7.08 (X) 3 = 21 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump [x] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [x]

Pump Make/Model: 2" Grundfos   Purge Equipment Decon'd? Y [x] N [ ]

Depth of Pump Intake (feet): 78.00   Purge/Decon Water Containerized? Y [x] N [ ]   Container Type/Volume? ______

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1523								START @ 2.0 GPM
1526	6	70.4	7.33	1346	13.4	0.75	94.0	CLEAR
1529	12	71.0	7.1	1333	5	2.36	92.0	CLEAR DTW=65.94
1531	16	71.3	7.0	1329	7	2.45	90.2	CLEAR
1533	20	71.1	7.0	1338	61	2.82	85.1	DTW=71.03
1535	24	71.2	7.0	1337	8	3.10	86.9	D.O 2.0 mg/L Chemets
1541	36	70.1	7.0	1339	5	3.25	87.1	CLEAR
1544								END PUMP

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate: ______
Bailer: [x] Type: disp.
Other: [ ] Desc.: ______

Sample ID: OC-GW-OW2-021903

Dup. ID (if appl.): ______

Sample Time: 15:50

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 VOA	HCl
1,4-dioxane	1 L Amber	—
perchlorate, NO_3/NO_2	500 mL poly	—
CH_4, C_2H_6, C_2H_4	2 VOA	—
DOC	2 VOA	—
MNA (Alkalinity, H_2S, CO_2, SO_4^{2-}, Cl^-)	500 mL poly	—
Fe^{+2}	1 cup field filtered	—
Orth	500 mL poly	NaOH

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-3	Site. Omega Chemical	Date: 2/20/03
Client: OPOG	Project No.:	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other: MS	
Well Headspace:	PID (ppm): 469	FID (ppm):
Sampler: MH RP w/ CDM TC w/ BTC		

Total Depth of Well (feet): 82.85 Reference Point: ________ Datum: ________

Depth to Water (feet). 65.50

Water Column Height (feet): 17.35 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / ___" - ___ Gal/feet = 11.3 +27.8 gal 39 (X) 3 = 117 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☑ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☑

Pump Make/Model: 2" Grundfos Purge Equipment Decon'd? Y ☑ N ☐

Depth of Pump Intake (feet): bottom Purge/Decon Water Containerized? Y ☒ N ☐ Container Type/Volume? 55 gal drum

START @ 924 2.0 GPM

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
929	10	~~25~~ 26.0	7.13	1499	26	1.95	-15.0	DTW = 68.51 / CLEAR
934	20	22.0	7.04	1508	22	3.53	10.0	DTW = 69.67
939	30	22.5	7.01	1512	22	3.82	17.5	DTW = 70.60
944	40	22.5	6.98	1513	20	4.67	26.6	DTW = 71.32
949	50	22.5	6.98	1513	19	4.78	27.6	DTW = 71.80
954	60	22.5	6.98	1514	14	4.84	32.8	DTW = 72.27
959	70	22.5	7.08	1520	16	4.59	38.4	DTW = 72.90
1004	80	22.5	6.97	1516	20	4.84	32.6	DTW = 73.4 / raised pump to 77.0 '
1009	90	22.5	7.03	1510	478	4.83	-20.3	DTW = 74.10 TURBID
1014	100	22.5	7.07	1522	114	4.36	9.0	DTW = 75.32
1024	120	22.6	7.09	1518	66	4.28	10.4	DTW = 76.30 - Weston Sampling
1032	136	22.7	6.94	1524	49	4.50	4.8	

Chemets DO 4.0 mg/L

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ________

Bailer: ☒ Type: disposable

Other: ☐ Desc.: ________

Sample ID: OC-GW-OW3-022003

Dup ID (if appl.): ________

Sample Time: ~~1345~~ 1045

EB: 1105 OW3(N)

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 VOA	HCl
1,4-dioxane	1 L Amber	–
perchlorate, NO_3/NO_2	500 mL poly	–
CH_4, C_2H_6, C_2H_4	2 VOA	–
DOC	2 VOA	–
MNA (Alkalinity, H_2S, SO_4^{2}, Cl, CO_2) Fe^{+2}	500 mL poly	–
	Cu - field filtered	–
CN	500 mL poly	NaOH

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MONITORING WELL PURGE AND SAMPLING FORM

Well No: OW-4A	Site: Omega Chemical	Date: 2/20/03
Client: OPOG	Project No.:	
Well Casing Diameter: 2" (4") 6" Other:	Well Casing Material: PVC SS Other: MS	
Well Headspace:	PID (ppm):	FID (ppm):
Sampler: RP + MH w/CDM TC w/BTS		

Total Depth of Well (feet): 74.60 Reference Point: ______ Datum: ______

Depth to Water (feet): (58.58)

Water Column Height (feet): 16.02 (X) 2" - 0.16 / (4") - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 10.41 (X) 3 = 117.6 Minimum Purge Volume (Gallons)

288 gal

39.2

PURGE METHOD:

Submersible Pump ☑ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: 2" Grundfos Purge Equipment Decon'd? Y ☐ N ☐

Depth of Pump Intake (feet): 60' Purge/Decon Water Containerized? Y ☒ N ☐ Container Type/Volume? 55-gal drum

START @ 1504 @ 5.0 GPM

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1508	20	22.8	7.12	1619	63	2.34	86.2	CLEAR
1510	30	22.8	7.04	1558	19	2.73	86.8	DTW = 59.55
1512	40	22.8	7.05	1534	13	2.92	86.9	DTW = 59.58
1514	50	22.8	7.06	1510	4	3.03	87.0	DTW = 59.58
1516	60	22.8	7.06	1502	4	3.09	86.4	DTW = 59.58
1518	70	22.8	6.99	1488	3	3.17	86.6	DTW = 59.58
1520	80	22.8	7.03	1483	2	3.27	87.0	DTW = 59.58
1522	90	22.8	7.03	1474	2	3.30	86.8	DTW = 59.57
1524	100	22.8	7.03	1458	2	3.33	86.5	DTW = 59.57
1528	120	22.7	7.04	1448	1	3.29	84.6	DTW = 59.58 / Weston Sample

Chemets 3 mg/L

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ______

Bailer: ☒ Type: disposable

Other: ☐ Desc.: ______

Sample ID: OC-GW-OW4A-022003

Dup. ID (if appl.): ______

Sample Time: 1545

SAMPLE ANALYSES:

MS/MSD

Method:	Container Type/Vol.	Preservative
8260B	5 VOA	HCl
1,4-dioxane	3 1 L Amber	—
perchlorate, NO_3/NO_2	500 mL poly	—
C_2H_6 CH_4 C_2H_4	2 VOA	—
DOC	4 VOA	
MNA-Alkalinity, H_2S, CO_2, SO_4, Cl		—
Fe^{+2}	Cup - field filtered	—
Cr+6	500 mL poly	NaOH

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-4B	Site: Omega Chemical	Date: 2/20/03
Client: OPOG	Project No.:	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other: MS	
Well Headspace:	PID (ppm): 0.0/0.0	FID (ppm):
Sampler: RosP, Mike Huffman/CDM Thei Chatman/BTS		

Total Depth of Well (feet): 126.80 Reference Point: ______ Datum: ______

Depth to Water (feet): 62.46

Water Column Height (feet): 64.34 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 Gal/feet = 41.8 (X) 3 = 195 Minimum Purge Volume (Gallons)

23.1 gal

64.9

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: 2" Grundfos Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 77' (?) tagged w/ WL meter - may be just the tubing Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? 55-gal drum

START 1330 5.0 GPM

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1334	20	22.6	7.47	1358	21	2.90	17.5	DTW = 66.55 / CLEAR
1338	40	22.6	7.39	1421	7	2.94	-4.1	DTW = 66.63 / CLEAR
1342	60	22.6	7.40	1426	8	3.06	1.6	DTW = 66.65 / CLEAR
1346	80	22.6	7.37	1438	4	3.09	6.9	DTW = 66.74 / CLEAR
1350	100	22.6	7.36	1431	2	3.10	4.9	DTW = 66.75 / CLEAR
1354	120	22.6	7.35	1437	1	3.13	-1.0	DTW = 66.76 / CLEAR
1358	140	22.6	7.38	1442	1	3.12	-3.0	DTW = 66.80
1402	160	22.6	7.41	1441	1	3.05	-3.7	DTW = 66.83
1406	180	22.6	7.36	1438	2	3.03	-0.4	DTW = 66.84
1409	195	22.6	7.40	1424	2	3.00	-2.1	DTW = 66.85 / WESTON sample
1417	235	23.2	7.30	1441	1	3.08	-2.8	

CHEMETS 2 mg/L

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate: ______

Bailer: [X] Type: DISP

Other: [ ] Desc.: ______

Sample ID: OCGW-OW4B-022003

Dup. ID (if appl.): ______

Sample Time: 14:30

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260	3 VOAs / 40 ml	HCl
Cr^{+6}	1 500 ml poly	NaOH
1,4 Dioxane	1 1L amber	—
NO_3/ClO_4	1 500 ml poly	—
DOC	2 VOAs	—

MNA - D.O, Sulfate, Sulfide, alkalinity, Fe^{2+}, CO_2, Cl^-

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW - 5	Site: Omega Chemical	Date: 2/21/03
Client: OPOG	Project No.:	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm): 46	FID (ppm):
Sampler:		

Total Depth of Well (feet): 49.72 Reference Point: ______ Datum: ______

Depth to Water (feet): 30.85

Water Column Height (feet): 18.87 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 Gal/feet = 12.26 (X) 3 = 117 Minimum Purge Volume (Gallons)

+26.7 gal (gravel pack)

38.96

PURGE METHOD:

Submersible Pump ☑ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: 2" Grund Fos Purge Equipment Decon'd? Y ☑ N ☐

Depth of Pump Intake (feet): 39' Purge/Decon Water Containerized? Y ☑ N ☐ Container Type/Volume? ______

START @ 726 5.0 GPM

Time	Gallons	Temp. (C/F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
730	20	22.5	6.86	1383	86	4.48	59.8	DTW = 31.28
734	46	22.5	6.95	1352	61	4.47	60.3	DTW = 31.29
736	56	22.5	6.97	1345	74	4.52	54.6	DTW = 31.29
738	60	22.5	6.99	1343	55	4.54	51.2	DTW = 31.29
740	70	22.5	7.04	1343	43	4.56	50.9	DTW = 31.29
742	80	22.5	7.04	1344	32	4.56	48.9	DTW = 31.29
744	100	22.5	7.03	1344	19	4.61	48.3	DTW = 31.29
746	110	22.5	7.04	1345	18	4.61	46.1	DTW = 31.29
747	115	22.5	7.05	1342	12	4.61	45.9	DTW = 31.29
748	120	22.5	7.09	1344	14	4.61	49.4	DTW = 31.29 / WESTON SAMPL
758	130	23.0	7.00	1351	11	4.33	51.6	SLOWED PUMP TO 1.0 GPM

Chemets 3.0 mg/L

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate:
Bailer: ☒ Type: DISP
Other: ☐ Desc.:

Sample ID: OC-GW-OW5-022103

Dup. ID (if appl.):

Sample Time: 3:00

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260	3 VOAS / 40ml	HCl

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW - 6	Site: Omega Chemical	Date: 2/21/03
Client: OPOG	Project No.:	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm): 1.0	FID (ppm):
Sampler: MH + TC		

Total Depth of Well (feet): 58.50 Reference Point: ______ Datum: ______

Depth to Water (feet): (47.49)

Water Column Height (feet): 11.0 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 7.15 (X) 3 = 92 Minimum Purge Volume (Gallons)

23.6 gal (gravel pack)

30.75

PURGE METHOD:

Submersible Pump [x] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: 2" Groundfos Purge Equipment Decon'd? Y [x] N [ ]

Depth of Pump Intake (feet): 49' Purge/Decon Water Containerized? Y [x] N [ ] Container Type/Volume? ______

START @ 852 5.0 GPM

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
854	10	22.3	7.18	1812	6	0.27	91.8	DTW= 47.64
856	20	22.3	6.90	1814	2	0.29	92.1	DTW= 47.65
858	30	22.3	6.88	1810	1	0.29	91.7	DTW= 47.66
900	40	22.3	6.89	1811	1	0.31	91.8	DTW= 47.66
902	50	22.3	6.88	1808	1	0.33	91.3	DTW= 47.65
904	60	22.3	7.00	1809	1	0.33	89.3	DTW= 47.66
906	70	22.3	6.88	1812	1	0.32	88.7	DTW= 47.67
908	80	22.3	6.87	1814	1	0.32	88.4	DTW= 47.67
910	90	22.3	6.92	1813	1	0.38	87.2	DTW= 47.67
911	95	22.3	6.96	1815	1	0.32	86.5	DTW= 47.67 / WESTON SAMPLE
914	98	22.5	6.80	1828	1	0.30	80.0	SLOWED PUMP TO 1.0 gpm

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate: ______
Bailer: [x] Type: DISP
Other: [ ] Desc.: ______

Sample ID: OC-GW-OW6-022103

Dup. ID (if appl.): ______

Sample Time: 930

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260	3 VOAs / 40 ml	HCl

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MONITORING WELL PURGE AND SAMPLING FORM

Well No: OW - 7	Site: Omega Chemical	Date: 2/21/03
Client: OPOG	Project No.:	
Well Casing Diameter: 2" (4") 6" Other:	Well Casing Material: PVC SS Other:	
Well Headspace: PID (ppm): 8	FID (ppm):	
Sampler: MH + TC		

Total Depth of Well (feet): 89.55 Reference Point: ______ Datum. ______

Depth to Water (feet): 76.89

Water Column Height (feet): 12.66 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 Gal/feet = 8.22 (X) 3 = 82 Minimum Purge Volume (Gallons)

19.02 gal (gravel pack)

27.24

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: 2" Groundfos Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 83' Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? Steel Drum 55 gal

START @ 1036 2.0 GPM

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
1041	10	22.1	7.31	1472	28	1.44	77.9	DTW=79.75
1046	20	22.0	7.11	1492	27	3.69	77.3	DTW= 81.00
1051	30	21.9	7.19	1497	21	3.51	80.4	DTW= 82.60 / STOP PUMP
1051								LOWER PUMP 3' SLOW PUMP to 1.0 GPM
1104	40	22.4	7.04	1505	12	3.96	72.5	DTW = 80.40
1114	50	22.4	6.97	1511	5	4.23	74.2	DTW= 80.40
1124	60	22.4	6.93	1513	3	4.13	76.5	DTW= 80.55
1139	76	22.3	6.94	1499	6	4.34	74.5	DTW= 81.69
1150	86	22.3	6.89	1506	3	4.35	73.2	DTW= 81.90
1154	90	22.3	6.90	1504	2	4.47	75.5	DTW= 82.00
1156	92	22.3	6.92	1511	2	4.35	75.3	DTW= 82.03 / WESTON SAMPLING
1202	98	22.3	6.99	1495	3	4.46	72.0	

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate: ______
Bailer: [X] Type: DISP
Other: [ ] Desc.: ______

Sample ID: OC-GW-OW7-022103

Dup. ID (if appl.): ______

Sample Time: 12:15

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260	3 VOAs / 40ml	HCl

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW-8	Site: Omega Chemical	Date: 2/20/03
Client: OPOG	Project No.:	
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC ~~SS~~ Other: MS	
Well Headspace:	PID (ppm): 324	FID (ppm):
Sampler: R. Prabharasuth Trei Chatman		

Total Depth of Well (feet): 79.60 ~~67.55~~ ~~67.46~~ Reference Point: TOC Datum: ______

Depth to Water (feet): 67.37 ~~67.46~~

Water Column Height (feet): 12.23 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 7.9 + 15.8 gravel pack = 23.7 (X) 3 = 71.2 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☑ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☑

Pump Make/Model: 2" Grundfos Purge Equipment Decon'd? Y ☒ N ☐

Depth of Pump Intake (feet): 69' Purge/Decon Water Containerized? Y ☒ N ☐ Container Type/Volume? holding tank 55-gal drum

Start 738 Flow Rate 3.0

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	DO (ppm)	Eh (mV)	Observations/Comments
740	6	66.0	6.77	1665	22	0.85	-141.2	DTW = 67.82 / odor
742	12	68.9	6.83	1626	20	1.21	-142.6	DTW = 67.83
744	18	69.9	6.84	1627	15	1.34	-142.7	DTW = 67.83
746	24	70.3	6.88	1625	10	1.47	-142.7	DTW = 67.83
748	30	70.5	6.86	1624	8	1.54	-144.3	DTW = 67.83
750	36	69.9	6.95	1629	6	1.60	-147.3	DTW = 67.83
753	45	69.2	6.90	1649	4	1.56	-152.6	DTW = 67.83
756	54	69.7	6.87	1640	3	1.58	-153.8	DTW = 67.84
759	63	69.9	6.88	1647	2	1.60	-153.0	DTW = 67.85
802	72	69.6	6.89	1662	3	1.57	-154.5	DTW = 67.84 / D.O 1.0 mg/L
817	117	68.3	6.89	1676	3	1.57	-155.1	
818	END	PUMP						

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate: ______
Bailer: ☑ Type: disposable
Other: ☐ Desc.: ______

Sample ID: OC-GW-OW8-022003
Dup. ID (if appl.): OC-GW-OW8K-02203
Sample Time: 820

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 VOA	HCl
1,4-dioxane	1 L Amber	—
perchlorate/ NO_3/ NO_2	500mL poly	—
CH_4, C_2H_6, C_2H_4	2 VOA	—
DOC	2 VOA	—

MNA (Alkalinity, SO_4^{-2}, Cl^-, CO_2, H_2S) 500mL poly —

Fe^{+2} field filtered —

Cr^{+6} 500mL poly NaOH

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.:	∂W1	Site:	Omega Chemical
Client:	Omega	Project No.:	10500-30697

Well Casing Diameter: 2" (4") 6" Other:

Well Casing Material: PVC (SS) Screen Other: and Blank

Well Headspace: PID (ppm): FID (ppm):

Sampler: Will Grove Date 20 Aug 2002

Total Depth of Well (feet): 82.80 Reference Point: TOC Datum:

Depth to Water (feet): 75.97

Water Column Height (feet): 6.81 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __ " - __ Gal/feet = 4.4 + 18.5 g gravel pack = 22.9 (X) 3 = 68.8 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☐ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: Grundfos Rediflo 2

Purge Equipment Decon'd? Y ☑ N ☐

Depth of Pump Intake (feet): 81

Purge/Decon Water Containerized? Y ☑ N ☐

Container Type/Volume?

12:24 Start pump Rate 2.5 down to ~0.5 gpm.

Time	Gallons	Temp. (C)/ F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	ORP Other	Depth to water ft Observations/Comments
1226	5	22.2	6.75	1621	114	-48	80' odor - stopped pump
	7.5 Dewatered well			wait for		recharge - 0.75 gpm	
1253	10	22.9	6.74	1631	146	-38	
1258	15	23.1	6.63	1631	173	-14	
1307	22	23.8	6.77	1630	22	-0	80.55
1316	29	24.0	6.63	1635	159	-0	80.25 Dropped Rate
1333	36	24.2	6.63	1632	16	-40	80.65 to 0.5 gpm or less
1344	43	24.1	6.67	1632	14	523	81.15 - DRY
							will allow 80% Recovery
1430	76.45'	@ 80% recovery					and Sample

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate:
Bailer: ☒ Type: for 40ml VOA.
Other: ☐ Desc.:

Sample ID: OC-GW-∂W1-082002

Dup. ID (if appl.):

Sample Time: 1400 - actually ~1440

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 x 40ml VOA	HCl
1,4-Dioxane	1 x 1L Amber	—
	EPA Split	

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: 0W1b	Site: Terra Pave
Client: Omega	Project No.:
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Screen Other: Mild Steel Blank
Well Headspace: PID (ppm):	FID (ppm):
Sampler: Will Grove	Date 20 Aug 2002

Total Depth of Well (feet): 118.20

Depth to Water (feet): 77.04

Reference Point: Top of Casing

Datum: ______

Water Column Height (feet): 41.16 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 26.8 (X) 3 = 80.4 Minimum Purge Volume (Gallons)

PURGE METHOD:

Submersible Pump ☑ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☑

Pump Make/Model: 2" Grundfos

Purge Equipment Decon'd? Y ☑ N ☐

Depth of Pump Intake (feet): 115'

Purge/Decon Water Containerized? Y ☑ N ☐

Container Type/ Volume? Truck Tank

Start = 1019 gpm = 1.5

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	ORP Other	DTW Observations/Comments
1021	3	21.8	7.08	1116	407	-0	83.40 Odor (sulfur)
1026	9	22.0	7.46	987	203	-143	88.49 "
1030	15	22.4	7.45	972	168	-163	93.62 "
1034	21	22.5	7.49	970	107	-175	97.35 "
1038	27	22.6	7.56	973	76	-182	102.62 "
1042	33	22.8	7.56	973	99	-183	107.45 "
1046	39	22.9	7.61	975	120	-176	112.40 "
1050	45	22.9	7.60	992	152	-175	115.52 "
—	Well	Dewatered	@ 46 gals.	—			Need 85.2' for 80% recovery

SAMPLE COLLECTION METHOD:

Pump: ☑ Flow rate: ______

Bailer: ☑ Type: wt. Disp.

Other: ☐ Desc.: ______

Sample ID: OC-GW-0W1b-082002

Dup. ID (if appl.): ______

Sample Time: 1500

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 x 40ml VOA	HCl
1,4-Dioxane	1 x 1L Amber	–
	EPA Split	

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW2		Site: ~800' N of Washington Blvd W. side of Putnam Dr	
Client: Omega		Project No.: 10500-30697-	
Well Casing Diameter: 2" (4") 6" Other:		Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm):	FID (ppm):	
Sampler: Will Grove		Date 21 Aug 2002	

Total Depth of Well (feet): 80.23 Reference Point: TOC Datum:

Depth to Water (feet): 68.30

Water Column Height (feet): 11.93 (X) 2" - 0.16 / (4" - 0.65) / 6" - 1.47 Gal/feet = 7.75 (X) 3 = 116 Minimum Purge Volume (Gallons)

+ 30.8 gal (gravel Pack)

38.55

PURGE METHOD:

Submersible Pump [x] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: Grundfos Rediflo 2 Purge Equipment Decon'd? Y [x] N [ ]

Depth of Pump Intake (feet): ~76 Purge/Decon Water Containerized? Y [x] N [ ] Container Type/Volume? 55 gal Drum

0734 = Start Pump gpm = 4.0

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	ORP ~~Other~~	DTW Observations/Comments
736	8	21.9	6.83	1317	9	52	71.29
739	20	22.1	6.93	1305	10	45	71.45
744	40	22.1	6.92	1305	9	30	71.83
749	60	22.0	6.89	1307	9	44	72.12
754	80	22.1	6.83	1306	9	61	72.29
759	100	22.0	6.87	1307	12	64	72.61
801	108	22.1	6.93	1307	10	45	72.74
803	116	22.1	6.90	1308	9	53	72.81

SAMPLE COLLECTION METHOD:

Pump: [✓] 1,4-Dioxane Flow rate:
Bailer: [✓] Type: VOA
Other: [ ] Desc.:

Sample ID: OC-GW-OW2-082102

Dup. ID (if appl.):

Sample Time: 08:10

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3x 40 ml VOA	HCl
1,4-Dioxane	1x1L Amber	–
	EPA Split	

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MONITORING WELL PURGE AND SAMPLING FORM

Camp Dresser & McKee 08/19/94 2:27:13 MWPURGE 4D\ I:\PROJECTS\...

Well No.: OW 3	Site: ~250' N. of Washington Blvd W. side of Putnam Dr
Client: Omega	Project No.:
Well Casing Diameter: 2" (4") 6" Other:	Well Casing Material: PVC SS Other:
Well Headspace: PID (ppm):	FID (ppm):
Sampler: Will Grove	Date: 20 Aug 2002

Total Depth of Well (feet): 82.77 Reference Point: TOC Datum: ____

Depth to Water (feet): 64.47

Water Column Height (feet): 18.30 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 11.9 (X) 3 = 119 Minimum Purge Volume (Gallons)

+ 27.8 gal (gravel pack)

39.7

PURGE METHOD:

Submersible Pump ☒ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: Grundfos Redi flo 2 Purge Equipment Decon'd? Y ☒ N ☐

Depth of Pump Intake (feet): ~79' Purge/Decon Water Containerized? Y ☒ N ☐ Container Type/Volume? Truck Tank

1604 = start Pump gpm = 2.5

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	ORP ~~Other~~	DTW Observations/Comments
1606	5	22.9	7.41	1440	24	11	Odor
1612	20	22.5	7.20	1474	13	36	71.83 "
1620	40	22.6	6.95	1501	53	24	74.85 "
1628	60	22.9	7.12	1508	40	190	78.25 "
1629	~~80~~	Dry /	Stop for	recharge to	67.30' (80%)		— "
1650	~~100~~ 80	23.0	7.17	1496	98	31	74.36 " 2.5 gpm
1658	~~110~~ 100	22.9	7.07	1501	251	44	78.11 Start 16:42
1658	~~120~~	Dry /	Stop for	recharge to	80%		— restart @ 17:12
1716	110	22.8	7.00	1507	27	~~30~~	72.23
1720	120	22.6	6.93	1499	86	28	

SAMPLE COLLECTION METHOD:

Pump: ☑ Flow rate: 0.5 gpm

Bailer: ☑ Type: WH. ~~Disp. Bar~~

Other: ☐ Desc.:

Sample ID: OC-GW-OW3-082002

Dup. ID (if appl.):

Sample Time: 1720

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260 B	3 x 40 ml VOA	HCl
1,4-Dioxane	1 x 1 L Amber	—
	EPA Split	

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW4A	Site: @12455 Washinton inturn Lane N. side of Street
Client: Omega	Project No.: 10500-30697
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Screen Other: Blank Steel
Well Headspace: PID (ppm):	FID (ppm):
Sampler: Will Grove	Date 21 Aug 2002

Total Depth of Well (feet): 74.88 Reference Point: TOC Datum:

Depth to Water (feet): 56.80

Water Column Height (feet): 18.08 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 11.75 (X) 3 = 122 Minimum Purge Volume (Gallons)

+28.8 gal (gravel pack)

40.55

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: Grundfos Rediflo 2 Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): ~72 Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? 55 gal. drum

1316 = Start Pump gpm = 5.0

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	ORP	DTW Observations/Comments
1318	10	23.4	7.09	1824	15	39	
1320	20	23.1	7.02	1776	33	30	57.48
1324	40	23.0	6.96	1675	23	41	57.47
1328	60	22.9	6.91	1664	28	46	57.55
1332	80	22.9	6.90	1663	15	45	57.54
1336	100	22.9	6.91	1659	9	48	57.54
1338	110	22.9	6.88	1642	11	37	57.59
1340	120	22.8	6.94	1646	10	45	57.60
1341	125	22.8	6.92	1648	9	55	57.60

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate: for Dioxane
Bailer: [X] Type: VOA - disposable
Other: [ ] Desc.:

Sample ID: OC-GW-OW4A-082102

Dup. ID (if appl.):

Sample Time: 1350

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3x 40ml VOA	HCl
1,4-Dioxane	1x 1L Amber	-
	EPA Split	

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environmental engineers, scientists, planners, & management consultants

MONITORING WELL PURGE AND SAMPLING FORM

west most well

Well No.: OW4B	Site: @ 12455 Washington Blvd in Turn Lane N. side of street.
Client: omega	Project No.: 10500-30697
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Stream Other: Black Steel
Well Headspace: PID (ppm):	FID (ppm):
Sampler: will Grove	Date: Aug 2002

* Not measured exactly.

Total Depth of Well (feet): 127.00 Reference Point: TOC Datum: ______

Depth to Water (feet): 63.64

Water Column Height (feet): 63.36 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 Gal/feet = 41.18 (X) 3 = 193 Minimum Purge Volume (Gallons)

+ 23.1 gal (filter pack)

64.28

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: Grundfos Rediflo 2 Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 124 Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? 55 gal. drums

Start = 1424 gpm = 5

Time	Gallons	Temp. (C / F)	pH	Conductivity (μmhos/cm)	Turbidity (NTUs)	ORP ~~Other~~	DTW Observations/Comments
1428	10	23.3	7.41	1007	17	-509	Stop Added 36' tubing
1446	30	22.9	7.38	1294	14	529	restart 1442 DTW=67.5
1450	50	22.9	6.81	1374	11	41	67.68
1454	70	22.7	7.33	1408	12	0	67.94
1458	90	22.6	7.26	1413	11	3	67.96
1502	110	22.6	7.28	1415	10	532	68.25
1506	130	22.6	7.26	1418	11	15	68.39
1510	150	22.5	7.26	1415	9	2	68.47
1514	170	22.5	7.23	1417	9	5	68.54
1517	185	22.6	7.27	1412	11	529	68.82
1519	195	22.5	7.21	1419	10	11	68.91

SAMPLE COLLECTION METHOD:

Pump: [X] Flow rate: 1 L min

VOCs Bailer: [X] Type: Disp. Bailer for VOCs

Other: [ ] Desc.:

Sample ID: OC-GW-OW4b-082102

Dup. ID (if appl.):

Sample Time: 1525

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
~~8021~~ 8260B	3 * 40ml VOA	HCl
1,4-Dioxane	1 * 1L Amber	
	EPA Split	

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW5		Site: S side of Rivera of ~100' W of Byron	
Client: Omega		Project No.: 10500-30697	
Well Casing Diameter: 2" 4" 6" Other:		Well Casing Material: PVC SS Other:	
Well Headspace:	PID (ppm):	FID (ppm):	
Sampler: Will Grove		Date: 22 Aug 2002	

Total Depth of Well (feet): 49.85 Reference Point: ______ Datum: ______

Depth to Water (feet): 30.03

Water Column Height (feet): 19.82 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 12.88 (X) 3 = 119 Minimum Purge Volume (Gallons)

+ 26.7 gal (gravel pack)

39.58

PURGE METHOD:

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: Grundfos Rediflo 2 Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): ~42 Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? 55 gal. drum

Start = 809 gpm = 5.0

Time	Gallons	Temp. (C F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	~~Other~~ ORP	DTW Observations/Comments
811	10	21.4	7.18	1308	56	33	
813	20	22.0	7.09	1290	46	15	30.36
817	40	21.9	6.97	1287	33	20	30.36
821	60	22.1	6.99	1283	22	16	30.38
823	70	22.1	7.01	1282	21	16	30.38
825	80	22.1	7.03	1283	20	9	30.38
827	90	22.2	7.01	1283	17	10	30.38
829	100	22.1	7.06	1285	21	14	30.38
831	110	22.0	7.03	1285	16	19	30.38
833	120	22.2	7.04	1286	16	17	30.38

SAMPLE COLLECTION METHOD:

Pump: [ ] Flow rate:
Bailer: [X] Type: Wt. Disp.
Other: [ ] Desc.:

Sample ID: OC-GW-OW5-082202

Dup. ID (if appl.):

Sample Time: 0845

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260 B	3 x 40ml VOA	HCl
	EPA Split	

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW6	Site: ~200' S. of Washington Blvd. W side of Lambert
Client: omega	Project No.:
Well Casing Diameter: 2" (4") 6" Other:	Well Casing Material: PVC SS Other:
Well Headspace: PID (ppm):	FID (ppm):
Sampler: Will Grove	Date: 21 Aug. 2002

Total Depth of Well (feet): 58.56 Reference Point: TOC Datum: ______

Depth to Water (feet): 45.70

Water Column Height (feet): 12.86 (X) 2" - 0.16 / (4" - 0.65) / 6" - 1.47 Gal/feet = 8.36 (X) 3 = 96 Minimum Purge Volume (Gallons)

23.6 gal (gravel pack)

31.96

PURGE METHOD: ___"-___

Submersible Pump [X] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [ ]

Pump Make/Model: Grundfos Rediflo 2 Purge Equipment Decon'd? Y [X] N [ ]

Depth of Pump Intake (feet): 52 Purge/Decon Water Containerized? Y [X] N [ ] Container Type/Volume? ______

1025 start time

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	ORP Other	DTW Observations/Comments
1026	5	22.0	6.98	1663	14	63	
1028	15	22.2	6.89	1763	11	13	
1030	25	22.2	6.95	1769	8	29	45.92
1032	35	22.2	6.80	1772	6	24	45.91
1034	45	22.2	6.84	1775	6	23	45.81
1036	55	22.1	6.79	1775	7	24	45.81
1038	65	22.2	6.84	1778	6	32	45.81
1040	75	22.1	6.80	1776	6	37	45.83
1042	85	22.1	6.80	1776	6	43	45.93
1044	95	22.2	6.80	1777	6	29	45.92
1045	100	22.2	6.86	1777	7	44	45.93

SAMPLE COLLECTION METHOD:

Pump: [X] Flow rate:
Bailer: [ ] Type: VOA Wt. Disp.
Other: [ ] Desc.:

Sample ID: OC-GW-OW6-082102

Dup. ID (if appl.):

Sample Time: 1100

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	3 x 40ml VOA	HCl
	EPA split	

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW7		Site: E side of Road in front of 12504 Whittier	
Client: omega		Project No.:	
Well Casing Diameter: 2" (4") 6" Other:		Well Casing Material: PVC (SS) screen Other: Blank steel	
Well Headspace:	PID (ppm):	FID (ppm):	
Sampler: Will Grove		Date: 21 Aug 2002	

Total Depth of Well (feet): 92.30 ? Reference Point: TOC Datum: ______

Depth to Water (feet): 75.86

Water Column Height (feet): 16.44 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 Gal/feet = 10.69 (X) 3 = 89.1 Minimum Purge Volume (Gallons)

+ 19.02 gal gravel pack

29.71

PURGE METHOD.

Submersible Pump [✓] Bladder Pump [ ] Hand Pump [ ] Peristaltic Pump [ ] Bailer: PVC [ ] Teflon [ ] SS [ ] Disposable [✓]

Pump Make/Model: 2" Grundfos Purge Equipment Decon'd? Y [✓] N [ ]

Depth of Pump Intake (feet): 85' Purge/Decon Water Containerized? Y [✓] N [ ] Container Type/Volume? 55 gal. Drum

08:37 = Start gpm = 3.0 → 2.0 Two (2) gpm max!

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	ORP / Other	DTW / Observations/Comments
839	6	21.6	7.30	1337	27	56	3.5 gpm too high 8:42 Stop
848	17.5	21.7	7.03	1456	146	51	restart 8:46 2gpm
851	24	21.8	6.92	1485	132	36	80.64 2.5
855	32	21.3	7.07	1485	108	77	81.10 857 Dry 36gal
910 ~~859~~	40	21.2	6.98	1509	15	34	78.64 wait 80% 908 2gpm
914 ~~903~~	48	21.8	6.89	1507	77	39	79.80
918 ~~907~~	56	21.9	6.87	1503	81	52	79.88
922 ~~911~~	64	21.9	6.82	1505	98	59	80.22
926 ~~915~~	72	21.9	6.86	1509	45	64	80.45
930 ~~919~~	80	21.9	6.81	1510	25	60	80.54
934 ~~922~~	86	21.9	6.86	1510	15	59	80.65
938 ~~924~~	90	21.9	6.83	1512	11	60	

Doing MS/MSD — Lower hose so only 5-6' are out of well.

SAMPLE COLLECTION METHOD:

Pump: [✓] Flow rate: 0.5 gpm
Bailer: [✓] Type: Wt Disp.
Other: [ ] Desc.:

Sample ID: OC-GW-OW7-082102

Dup. ID (if appl.):

Sample Time: 0945

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260	6 x 40 ml VOA	HCl
	EPA Split	

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MONITORING WELL PURGE AND SAMPLING FORM

Well No.: OW 8	Site: ~400 N of Washington Blvd. W side of Putnam Dr
Client: Omega	Project No.: 10500-30697-
Well Casing Diameter: 2" 4" 6" Other:	Well Casing Material: PVC SS Screen Other: Blank Steel
Well Headspace: PID (ppm): ~~324~~	FID (ppm):
Sampler: Will Grove	Date 22 Aug 2002

Total Depth of Well (feet): 79.93 Reference Point: TOC Datum: ______

Depth to Water (feet): 66.46

Water Column Height (feet): 13.47 (X) 2" - 0.16 / 4" - 0.65 / 6" - 1.47 / __" - __ Gal/feet = 8.8 (X) 3 = 74 Minimum Purge Volume (Gallons)

+ 15.8 gal gravel pack

24.6

PURGE METHOD.

Submersible Pump ☑ Bladder Pump ☐ Hand Pump ☐ Peristaltic Pump ☐ Bailer: PVC ☐ Teflon ☐ SS ☐ Disposable ☐

Pump Make/Model: 2" Grundfos Purge Equipment Decon'd? Y ☑ N ☐

Depth of Pump Intake (feet): 75' Purge/Decon Water Containerized? Y ☑ N ☐ Container Type/Volume? 55 gal. drum

Start = 717 gpm = 5.0

Time	Gallons	Temp. (C / F)	pH	Conductivity (µmhos/cm)	Turbidity (NTUs)	ORP ~~Other~~	DTW Observations/Comments
719	10	21.6	7.11	1495	13	528	
721	20	21.8	7.01	1505	17	-0	67.06
723	30	21.8	6.99	1517	12	-0	67.11
725	40	21.8	6.95	1520	9	-0	67.13
727	50	21.8	6.97	1524	9	-35	67.15
729	60	21.9	6.95	1530	8	-34	67.08
731	70	21.8	6.95	1531	8	-12	67.08
732	75	21.9	6.96	1537	8	-33	67.05

Duplicate + Level IV deliverable

SAMPLE COLLECTION METHOD:

Pump: ☐ Flow rate:

Bailer: ☑ Type: for VOAs wt. Disp.

Other: ☐ Desc.:

Sample ID: OC-GW-OW8-082202

Dup. ID (if appl.): OC-GW-OW8K-082202

Sample Time: 0740, 0650 (dup)

SAMPLE ANALYSES:

Method:	Container Type/Vol.	Preservative
8260B	6 * 40 ml VOA	HCl
1,4-Dioxane	2 * 1L Amber	-
	EPA Split.	

CDM environmental engineers, scientists, planners, & management consultants

MONITORING WELL PURGE AND SAMPLING FORM

OW-2

TOTALIZER: 4128[0] @ 21

1'.43" | 5 gal @ 1|48

AQUIFER PUMP TEST DATA

March 10 2003

SITE NUMBER ______ CLIENT OMEGA CHEMICAL LOCATION PUTTNAM AVE PERSONNEL Will Grove Rob Lopez

JOB NUMBER 10500-37240 ELEVATIONS: MEASURING POINT ______ FT GROUND SURFACE ______ FT

PUMPED WELL NUMBER OW2 STATIC WATER LEVEL ~~69.30~~ FT 69.30

OBSERVATION WELL NUMBER — THICKNESS OF SCREENED INTERVAL ______ RADIUS OF PUMPED WELL ______ FT

DISTANCE BETWEEN PUMPED & OBSERVATION WELLS ______ FT

TOT= 4128[0] w/ dial @ 2:1

DATE	HOUR	TIME MINUTES PUMPING t	RECOVERY t'	t/t'	DEPTH TO WATER BMP (FEET)	WATER LEVEL ELEVATION (FEET)	DRAWDOWN s (FEET)	Δs	RESIDUAL DRAWDOWN s' (FEET)	DISCHARGE (GPM)	REMARKS
1140	0	69.30	(STATIC)				PI	PH	con Temp	Turg	TD 81.7' hard to tell
11:40:20		70.28									
11:40:40		70.60									
11:41:30		72.50									
11:42 00		72.52									~23 gpm
11:43:00		72.52									increased
11:44		72.62									23 sec ga
11:45		72.90									~3.0 21.5s/gal
11:46		73.16									
11:47		73.35									
11:48		73.64									
11:49		73.92									~2.? 1:43"
11:50		74.20									
11:52		74.68									41315.0 Totalizer
11:54		75.28									10 gal in 3:35 sec
1156		75.50						7.34	59x10 24	27	Adj down to 58.5 57.7 Hz
1158		75.61									41329.6
12:00		75.70									10 gal / 4.0 min @ 12 03
12:06		76.01									

CAMP DRESSER & KEE INC.

AQUIFER PUMP TEST DATA

March 10 2003 OW2

PROJECT OMEGA CHEMICAL

SWL = 69.30

WELL NO. OW-2

PAGE 2 OF 4

DATE (Started 11:40)	HOUR (End 15:40)	TIME MINUTES PUMPING	TIME MINUTES RECOVERY	t/t'	DEPTH TO WATER BMP (FEET)	WATER LEVEL ELEVATION (FEET)	DRAWDOWN S (FEET)	ΔS	RESIDUAL DRAWDOWN S' (FEET)	DISCHARGE (GPM)	REMARKS
12:11					76.21						57.7 → 57.2
12:18					76.23	Temp 23.0	pH = 7.13	EC = 60x10	Turb = 7.12	1219	@ 41381.0 gal
12:23					76.10						
12:30					76.02						
12:37					76.09		Temp = 23.4 pH = 7.14	EC = 60 x 10	Turb = 3.8	12:43:00	— 41436.7
1247					76.41						why the jump. Box kicked?
1257					76.58					@1306	lowered! 57.2 → 57.1 Hz
1307					76.32					@1306 @1317	41490.0 gal. @change 41514.5 Δ24.5÷11
1317					76.48			T 23.5 EC 60x10	Turb 2.5		
1327					76.56						
1342					76.76						
1354					76.76						
14:14					76.96						@ 14:28
14:23					76.98						- tighten discharge hose
14:36					77.25						
14:46					77.26						
15:00					77.32			Temp = 23.0 pH = 7.05 Ec = 60X10		Turb 3.2	41755.2 @ 15:06:00
15:12					77.69						
15:23					77.72						
1532					78.12						
15:44					78.53						

SWL = 69.40

AQUIFER PUMP TEST DATA

March 10 2003

WELL NO. OW-2

PROJECT OMEGA CHEMICALS

PAGE 3 OF 4

DATE	HOUR	TIME MINUTES PUMPING	TIME MINUTES RECOVERY	t/t'	DEPTH TO WATER BMP (FEET)	WATER LEVEL ELEVATION (FEET)	DRAWDOWN S (FEET)	ΔS	RESIDUAL DRAWDOWN S' (FEET)	DISCHARGE (GPM)	REMARKS
3-10-03	15:45	- pump off									
	15:45:15	78.00									
	30	77.43									
	45	76.92									
	46:00	76.44									
	15	75.95									
	30	75.47									
	45	75.03									
	15:47:00	74.55									
	15:47:30	73.61									
	15:48:00	72.98									
	15:48:30	—									
	15:49:00	71.59									
	15:49:30 ~~50:00~~	71.07									
	15:50:00	70.55									
	15:51:20 ~~00~~	70.05									
	15:52	69.81									
	15:53	69.70									
	15:54	69.64									
	15:55	69.60									
	15:57	69.53									

10-20 2min 60+ : 15min.
20-30: 5min

MINITROLL : 11.80
SUBMERGENCE

AQUIFER PUMP TEST DATA

SITE NUMBER ______ CLIENT OMEGA CHEMICALS LOCATION Puttnam Ave, Whitter PERSONNEL ROB LOPEZ, PEARL PEREIRA
JOB NUMBER 10500-37240 ELEVATIONS: MEASURING POINT TOC FT GROUND SURFACE ______ FT
PUMPED WELL NUMBER OW-3 STATIC WATER LEVEL 65.61 FT @ 8:57am
OBSERVATION WELL NUMBER - THICKNESS OF SCREENED INTERVAL ______ RADIUS OF PUMPED WELL ______ FT
DISTANCE BETWEEN PUMPED & OBSERVATION WELLS ______ FT

DATE	HOUR	TIME MINUTES		t/t'	DEPTH TO WATER BMP (FEET)	WATER LEVEL ELEVATION (FEET)	DRAWDOWN s (FEET)	Δs	RESIDUAL DRAWDOWN s' (FEET)	DISCHARGE (GPM)	REMARKS
		PUMPING t	RECOVERY t'								
3-13-3				PUMPING	TEST @	9:00 am					Totalizer: 4455.0 START
	9:00	0			65.61						
					67.15						changed puming rate ↓ a little
					67.99						
					–						Q = 1.33 gpm flow meter.
					–						
	9:05				68.84						Q = 1.42 gpm. flow meter.
					69.04						Q = 5 gallons 3.27sec
					69.34						⇒ 1.45 gpm
					69.73						
					69.86						
	9.10	10 min			70.31						
	9.12				70.43						
	9.14				70.75						
	9.16				70.98						
	9.18				71.15						
	9.20	20 min			71.31						
	9.25				71.69						Q = 5g/4min = 1.25gpm
	9.30	30 min			71.95						Q = 1.3 gpm

AQUIFER PUMP TEST DATA

PROJECT OMEGA CHEMICALS

WELL NO. OW-3
PAGE 2 OF 3

DATE	HOUR	TIME MINUTES PUMPING	TIME MINUTES RECOVERY	t/t'	DEPTH TO WATER BMP (FEET)	WATER LEVEL ELEVATION (FEET)	DRAWDOWN s (FEET)	Δs	RESIDUAL DRAWDOWN s' (FEET)	DISCHARGE (GPM)	REMARKS
3-13-3	9:40				72.08						pH: 7.09
	9:50				72.26					W.Q	Temp: 22°C [228.1 Hz
	10:00	60mins			72.94					9:36	EC: 60x10 μΩ
	10:15				74.09					3/13	TURB: 8.65 NTU
	10:30				74.86						9:30 am: Observed slight kink in
	10:45				75.45						tubing → ↓ in flow
	11:00				75.86						9:31 am: Put lock below to prevent kinking
	11:05				75.97						Q = 1.2 gpm @ 9:57
	11:10				76.10						Q = 1.33 gpm @ 10:00
	11:15				76.19						Q = 1.33 gpm @ 10 23
	11:25				76.26						
	11:30				76.32						pH : 7.20
	11:45				76.40					W.Q	Temp . 23°C
	12:00				76.31					11:05	EC : 68x10 μΩ
	12:15				76.42					3/13	TURB . 8.81 NTU
	12:30				76.51						
	12:45				76.77						Q = 1.2 gpm @ 11:57
	13:00				76.86						Q = 5gal/4.4 = 1.14 gpm
									Q = 1.25 gpm @ 12:35		
									= 26gal/21.5 = 1.21 @ 12:35		pH : 7.16
										W.Q	Temp . 24°C
							GW samples taken out of the port			12:28	EC . 70x10 μΩ
							@ 12:55 pm			3/13	TURB : 4.73 NTU

CAMP DRESSER & McKEE INC.

3/13/3   10-20, 2min   60+ : 15min
20-30, 5min

AQUIFER PUMP TEST DATA

PROJECT OMEGA CHEMICALS   SWL = 65.61   RECOVERY DATA   95% SWL 66.17   WELL NO. OW-3

DATE	HOUR	TIME MINUTES PUMPING	TIME MINUTES RECOVERY 12:59:45	t/t' = 76.90	DEPTH TO WATER BMP (FEET)	WATER LEVEL ELEVATION (FEET)	DRAWDOWN s (FEET)	Δs	RESIDUAL DRAWDOWN s' (FEET)	DISCHARGE (GPM)	REMARKS
3-13-03		PUMP WAS SHUT OFF AT					Max =				
	13:00		Elapse z 0								
			∅:15	75.92							
			∅ 45	75.10			Final Total Zer				
			1:00	74.75				44856.4			
			1:30	74.25							44856.4
			2:00	73.74							44550
			2:30	73.25							306.4 ÷ 240 =
			3:00	72.75							1.276 gpm
			3:30	72.32							
			4	71.81							
			5	71.11							
			6	70.42							
			7	69.61							
			8	69.30							
			9	68.80							
	13:10		10	68.40							
			12	67.66							
			14	67.12							
			16	66.71							
			19	66.29							
			20	66.20							
			22	66.04							

CAMP DRESSER & McKEE INC.

10-20 2 min 60 + 15 mins
20-30 " "

3/14
FRIDAY

MINITROLL
EMERGENCE 10.839 ft

AQUIFER PUMP TEST DATA

PAGE 1 OF ____

SITE NUMBER ____ CLIENT OMEGA CHEMICALS LOCATION WASHINGTON BLVD PERSONNEL ROB LOPEZ, PEARL PEREIRA
JOB NUMBER 10500 - 37240 ELEVATIONS: MEASURING POINT TOC FT GROUND SURFACE ____ FT
PUMPED WELL NUMBER OW 4A STATIC WATER LEVEL 58.40 FT 8 42 am
OBSERVATION WELL NUMBER — THICKNESS OF SCREENED INTERVAL ____ RADIUS OF PUMPED WELL ____ FT
DISTANCE BETWEEN PUMPED & OBSERVATION WELLS ____ FT

TOTALISER. 448559 RD (INITIAL)

DATE	HOUR	TIME MINUTES PUMPING t	TIME MINUTES RECOVERY t'	t/t'	DEPTH TO WATER BMP (FEET)	WATER LEVEL ELEVATION (FEET)	DRAWDOWN s (FEET)	Δs	RESIDUAL DRAWDOWN s' (FEET)	DISCHARGE (GPM)	REMARKS
3/14/03		PUMPING STARTED @			8 51.						
	8.51	0			58.40						changed pumping rate ↓ @ 8 51 30
					59.90						↑ @ 8 52 30
					59.46						Q = 10 gpm
					59 82						
	8.55				60 53						
					60 55						
					60 58						
					60 59						
					–						
					–						
	9.01	10 mins			60 60						Q = 50 gpm/4 53 mins = 10.24
	9 03				60.61						
	9.05				60 61						
	9 07				60.62						
	9 09				60 625						
	9.11	20 mins			60 63		pH=6 94				
	9 16				60 62		EC = 59 X 10, Temp = 21				
	9 21	30 mins			60 63		Turb=3.3				

CAMP DRESSER & McKEE INC.

60.69
58.40
2.29

OW 4A
3.14.03
Friday

AQUIFER PUMP TEST DATA

PROJECT: Omega Chemical   SWL = 58.40   WELL NO. OW 4A
PAGE 2 OF ____

DATE	HOUR	TIME MINUTES PUMPING	TIME MINUTES RECOVERY	t/t'	DEPTH TO WATER BMP (FEET)	WATER LEVEL ELEVATION (FEET)	DRAWDOWN s (FEET)	Δs	RESIDUAL DRAWDOWN s' (FEET)	DISCHARGE (GPM)	REMARKS
3-14-03	9:26				60.63					9.50am 3/14/03	pH : 6.95
	9:31				60.63						Temp . 17.5°C
	9:41				60.65	NB:	minitroll	0.50' less	- ref changed		EC : 60x10 μΩ
	9.51	60 mins			60.65		from 58.40	to	58.38.		TURBIDITY 2 13 NTU.
	10:06				60.66						
	10:21				60.66			pH =	6.97		45470.0 – 9:50'41
								Temp =	22.0		
	10:36				60.68		11 35	EC =	68x10		HERTZ: 79.4
								Turb =	1.15		
	10.51				60.68						Q = 10.3 gpm 10:08
	11.10				60 68						(45650.0 - 10:08 55)
	11:21				60.69			(46130.0	10:54 44)		Q=10.3 gpm 10 52
	11:36				60.68						46635.0 @ 11:43'38
	11:51				60.68		Q' 20 gal	/ 1 min	56 sec		pH = 7.11 Temp = 23.0
	12:06				60.67					12:19	EC = 70x10 Turb = 2.76
	12:21				60.67						
	12:36				60.69			(47160.0	12:34 48)		Q: 10.3 gpm @ 12:34
	12:51										

SHUT PUMP OFF @ 12:51 pm.

CAMP DRESSER & McKEE INC.

10-20 2min 60+ 15 min
2( ) 5min

OW4A
14-03
FRIDAY

AQUIFER PUMP TEST DATA

RECOVERY DATA

PROJECT OMEGA CHEMICALS SWL: 58.40 pump off @ 12:52:00 even

WELL NO. OW4A
PAGE 3 OF

DATE	HOUR	TIME MINUTES PUMPING	TIME MINUTES RECOVERY	t/t' 60.67	DEPTH TO WATER BMP (FEET)	WATER LEVEL ELEVATION (FEET)	DRAWDOWN s (FEET)	Δs	RESIDUAL DRAWDOWN s' (FEET)	DISCHARGE (GPM)	REMARKS
3-14-03	12:52		0								
	12:52 21		sec 21		59 21						
	12 53		1 min		58.67						47341 2 ← Final
	12 54		2 min		58 54						
	12:55		3 min		58.51						
	12:56		4 min		58 49						
	12:57		5 min		58 48						
	12 58		6 min		58 47						
	12:59		7 min		58 46						
	13:00		8		58 45						
	13:01		9		58 445						
	13:02		10		58.44						
	13:04		12		58.44						
	13:06		14		58.44						
	13:08		16		58 44						
	1310		18		58 44	@	95% recovery		will terminate		test
	13:12		20								
											47341.2
											44855.9
											2485.30 ÷ 241 =
											10.31 gpm

CAMP DRESSER & McKEE INC.

OW-8
3/11/03

OW 8
AVERAGE Q gpm = 10.4 gpm.

MINITROLL: NEW TEST
OW8_ PUMP_ 16gpm

AQUIFER PUMP TEST DATA

SITE NUMBER ______ CLIENT OMEGA CHEMICALS LOCATION PUTTNAM AVE PERSONNEL ROB LOPEZ, PEARL PEREIRA.
JOB NUMBER 10500- 37240 ELEVATIONS: MEASURING POINT ______ FT GROUND SURFACE ______ FT
PUMPED WELL NUMBER OW-8 STATIC WATER LEVEL 67.44 FT @ 10:30 am
OBSERVATION WELL NUMBER — THICKNESS OF SCREENED INTERVAL ______ RADIUS OF PUMPED WELL ______ FT
DISTANCE BETWEEN PUMPED & OBSERVATION WELLS ______ FT

DATE	HOUR	TIME MINUTES PUMPING t	TIME MINUTES RECOVERY t'	t/t'	DEPTH TO WATER BMP (FEET)	WATER LEVEL ELEVATION (FEET)	DRAWDOWN s (FEET)	Δs	RESIDUAL DRAWDOWN s' (FEET)	DISCHARGE (GPM)	REMARKS
03/11/03		PUMPING TEST START @ 10:35 am									419832 TOTALISER
	10:35	0			67.44					10.66 =	16 gallons 1:30 min
		1mins			68.60						
					69.51						pH: 6.81
					69.54					WQ	EC. 71 x10 μΩ
					69.55					10:38	TEMP: 22°C
	10.40	5mins			69.55		WLI got stuck.				TURB: 7.12 NTU
					69.55						
											FLOW 42080
					69.56						TEST:
					69.56						30 gallons in 2.50 min
	10:45	10mins			69.57						≅ 10.59 gpm
	47				69.60						
	49				69.62						pH: 6.73
	51				69.64						EC: 75 x10 μΩ
	53				69.64					W.Q	TEMP: 22°C
	10:55	20mins			69.64					10.53	TURB. 165 NTU
	11:00				69.67						
	11:05	30mins			69 69					10.78 = gpm	TOTAL: 10.5630 42283.3

((cont.) ((

OW-8 (pumping well)

AQUIFER PUMP TEST DATA

WELL NO. OW 8

PROJECT Omega Pump Test

PAGE 2 OF 3

DATE	HOUR	TIME MINUTES PUMPING	TIME MINUTES RECOVERY	t/t'	DEPTH TO WATER BMP (FEET)	WATER LEVEL ELEVATION (FEET)	DRAWDOWN s (FEET)	Δs	RESIDUAL DRAWDOWN s' (FEET)	DISCHARGE (GPM)	REMARKS
3/11/03	11:15				69.74						
	11:25				69.78					=	11:21:30 Total → 42468.6
	11:35				69.83						
	11:45				69.86						pH : 6.76
	12:00				69.94					W.Q	EC : 82 x 10 μΩ
	12:15				69.99					12:31	TEMP : 22°C
	12:30				70.08						TURB 0.60 NTU
	13:00				70.13						
	13:30				70.20						pH : 6.76
	13:45				70.27					W.Q	Ec : 81 x 10 μΩ
	14:00				70.29					13:27	TEMP : 22.5°C
	14:15				70.29	pH =	Temp = 22.2 6.77 turb	= 0.70	EC = 80 x 10		TURB : 1.53 NTU
	14:30				70.33						
									GPM =	2826 gal / 27 min	(1:28) min 43788.8 / 2:55:00 44071.3
		TURNED OFF MINITROLL @ 14:30				R RE-STARTED @ 14:35					
		SHUT PUMP OFF @ 14:35 10 sec.							=	10.46 gpm	
									G.W SAMPLE	14:25	
											pH = 6.79
										W.Q	EC: 80 x 10 μΩ
										14:26	TEMP : 22 5°C
											TURB 0.90 NTU

[illegible]
43788.8
282.5

CAMP DRESSER & McKEE INC.

3/11/3   10-20 . 2 min   60 +   15 mins
20-30 . 5 mins

AQUIFER PUMP TEST DATA

RECOVERY DATA.

STATIC: 67.44
95% RECOVERY =
70.33 - [(70.33 - 67.44) × 0.95]
= 67.58'

PROJECT OMEGA CHEMICALS

WELL NO. OW 8
PAGE 3 OF 3

DATE	HOUR	TIME MINUTES PUMPING t	TIME MINUTES RECOVERY t	t/t'	DEPTH TO WATER BMP (FEET)	WATER LEVEL ELEVATION (FEET)	DRAWDOWN s (FEET)	Δs	RESIDUAL DRAWDOWN s' (FEET)	DISCHARGE (GPM)	REMARKS
03-11-03	14:35		0		70.33						
			1 min		68.60						
					68.03						
					67.99						
					67.96						
					67.93						
					67.88						
					67.85						
					67.84						
					67.82						
	14:45		10 min		67.81						
	14 47				67.79						
	14:49				67.77						
	14:51				67.76						
	14 53				67.75						
	14:55		20 mins		67.73			TOTALISER : 444905			
	15:00				67.72						
	15:05				67.70						
	15:15										
	15:25							TOTALISER: 004451.0			3/12/03
	15:35										9 18 am

CAMP DRESSER & McKEE INC.

Appendix C
Well Survey Data

Bush & Associates Inc.

Land Surveyors

Whittier Monitoring Wells

Survey Measurements
September 17, 1999

Well No.	Calif. Coordinates Zone 7 NAD27 (Feet) Well C/L		UTM Coordinates Zone 11 NAD83 (Meters) Well C/L	
	N	E	N	E
OW-1	4101351.3	4274702.0	3759242.1 m	403554.4 m
OW-1B	4101331.7	4274666.4	3759236.3	403543.4
OW-2	4101362.0	4274396.2	3759246.6	403461.2
OW-3	4101113.0	4274538.0	3759170.1	403503.4

------------------------- Elevation (Feet) -------------------------

	Ground Surface	Lid	Top Pipe
OW-1	207.79		210.30 4" PVC
OW-1B	205.18	205.18	204.98 4" PVC
OW-2	201.04	201.04	200.10 4" PVC
OW-3	196.88	196.88	196.33 Steel

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Bush & Associates Inc.

Land Surveyors

Whittier Monitoring Wells

Survey Measurements
November 16, 2001

Well No.	Calif. Coordinates Zone 7 NAD27 (Feet) Well C/L		UTM Coordinates Zone 11 NAD83 (Meters) Well C/L	
	N	E	N	E
OW-4A	4100784.2	4273942.3	3759072.3 m	403320.6 m
OW-4B	4100782.7	4273932.3	3759071.9	403317.6
OW-5	4100291.9	4272058.3	3758929.8	402744.6
OW-6	4100352.7	4273577.3	3758942.3	403207.7

------------------------- Elevation (Feet) -------------------------

	Ground Surface	Lid	Top Pipe
OW-4A	182.73	182.73	182.47 4" Steel
OW-4B	182.63	182.63	182.22 4" Steel
OW-5	152.68	152.68	151.96 4" PVC
OW-6	170.94	170.94	170.54 4" Steel

LICENSED LAND SURVEYOR
DAVID A. BUSH
Exp. 12-31-02
No. 7052
★ STATE OF CALIFORNIA ★

David A. Bush

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Bush & Associates Inc.

Land Surveyors

Whittier Monitoring Wells

Survey Measurements

May 15, 2002

Well No.	Calif. Coordinates Zone 7 NAD 27 (Feet) Well C/L		UTM Coordinates Zone 11 NAD83 (Meters) Well C/L	
	N	E	N	E
OW-8	4101239.5	4274466.7	3759209.0 m	403482.2 m
OW-7	4101548.4	4274850.7	3759301.6 m	403600.4 m

---------------------------- Elevation (Feet) ---------------------------

	Ground Surface	Lid	Top Pipe	
OW-8	199.03	199.03	198.42	4.5" Steel
OW-7	213.34	213.34	212.01	4.5" Steel

LICENSED LAND SURVEYOR
DAVID A. BUSH
Exp. 12-31-02
No. 7052
★ STATE OF CALIFORNIA ★

Bush & Associates Inc.

Land Surveyors

Whittier Monitoring Wells

Survey Measurements

November 19, 2004

	Calif. Coordinates Zone 7 NAD 27 (Feet) Well C/L		UTM Coordinates Zone 11 NAD83 (Meters) Well C/L	
WELL	N	E	N	E
OW-8B	4101250.4	4274461.4	3759212.3 m	403480.6 m
PZ-1	4101198.5	4274490.2	3759196.4 m	403489.2 m
PZ-2	4101284.3	4274441.7	3759222.7 m	403474.8 m

---------------------------- ELEVATION (Feet) -------------------------

	Ground	Lid	Top Pipe
OW-8B	199.27	199.27	198.65 4 1/2" PVC
PZ-1	198.41	198.41	198.04 2 1/4" PVC
PZ-2	199.83	199.83	199.29 2 1/4" PVC

LICENSED LAND SURVEYOR
DAVID A. BUSH
Exp. 12/31/06
No. 7052
STATE OF CALIFORNIA

David A. Bush

11-23-04

fax transmittal memo

# of pages > 1	
To SHARON WALLIN	From David Bush
Co. COM	Co. Bush & Assoc. Inc.
Fax # 752 1307	Phone# 949 752-1888

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Appendix D
Analytical Reports and COCs

2070176

UNSCANNABLE MEDIA

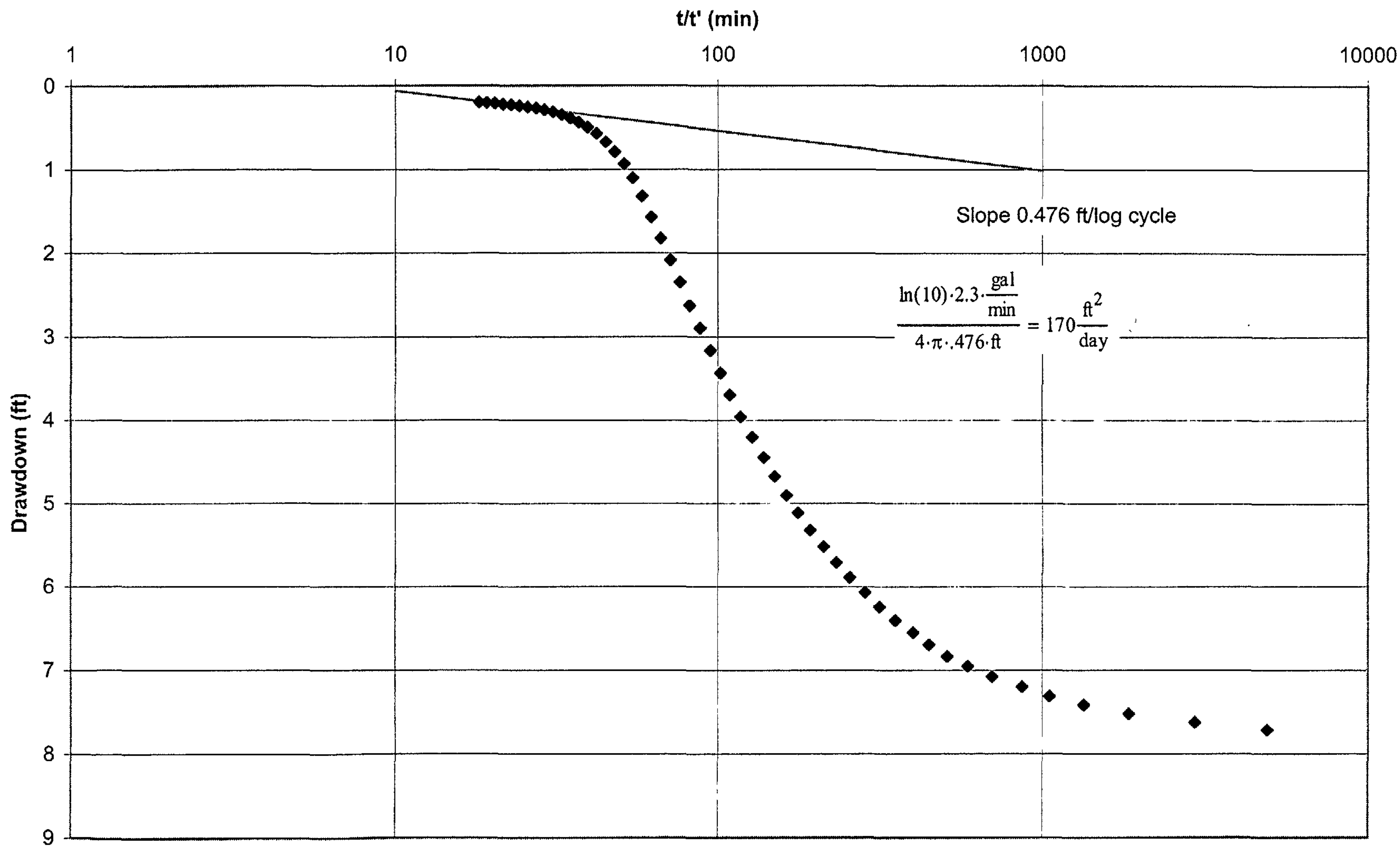
To use the unscannable media document(s),
contact the Region IX Superfund Records Center
in San Francisco at 415-536-2000.

Unscannable media - parent

Appendix E
Aquifer Test Data

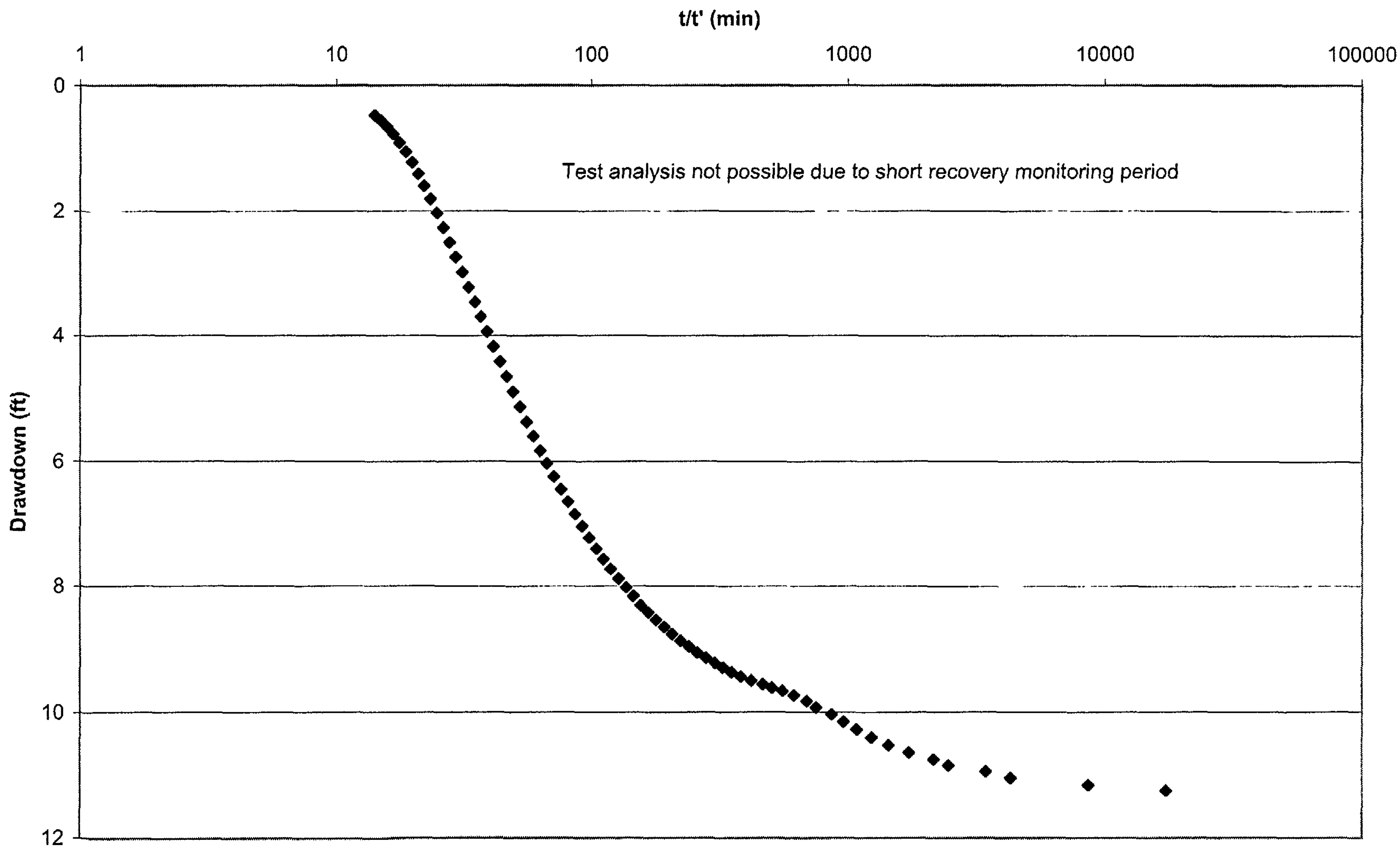
CDM

Figure E-1, Recovery Test at OW2



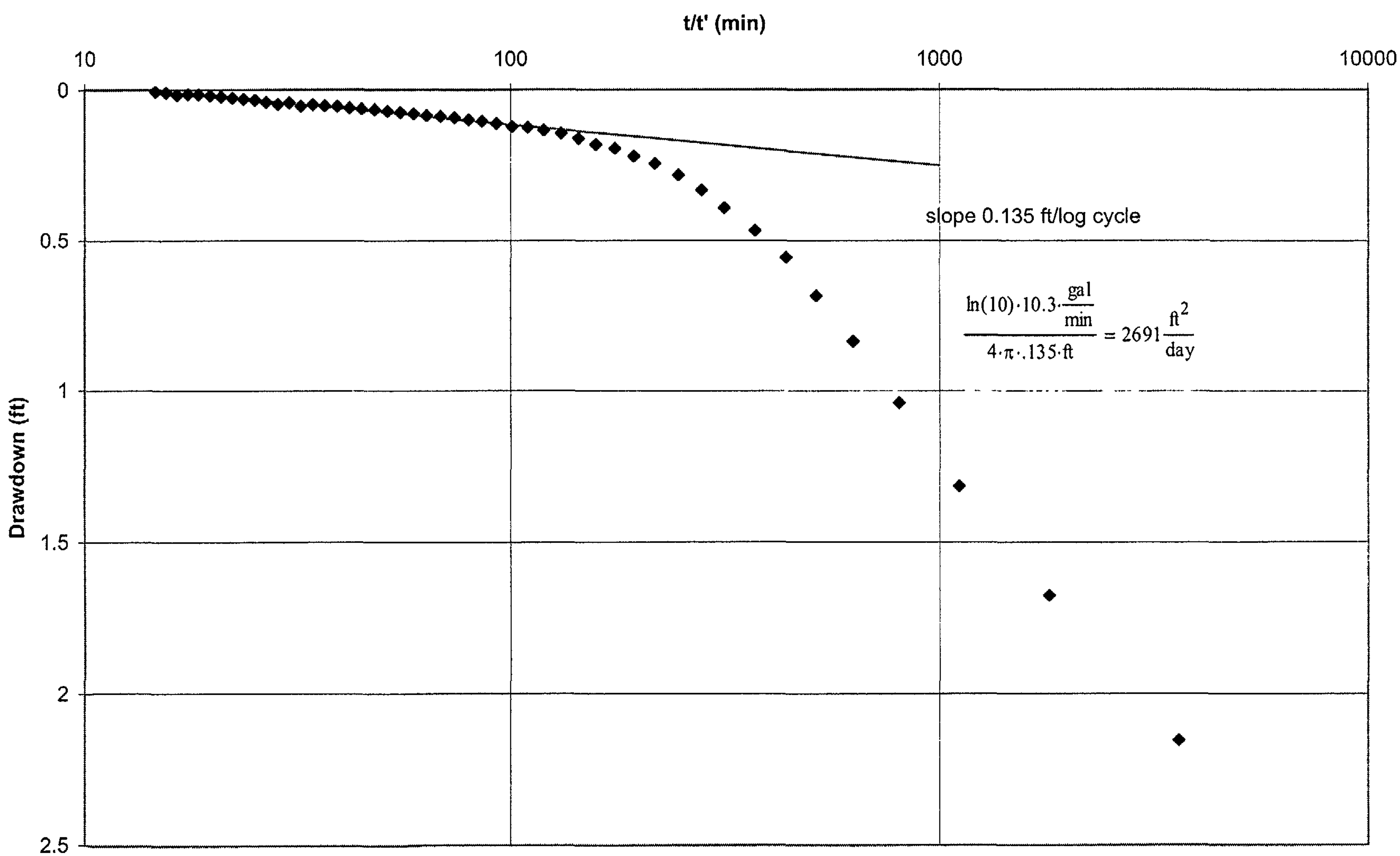
Z:\Omega\Spring_03_Test_Data\OW2_rec.xls

Figure E-2, Recovery Test at Well OW3



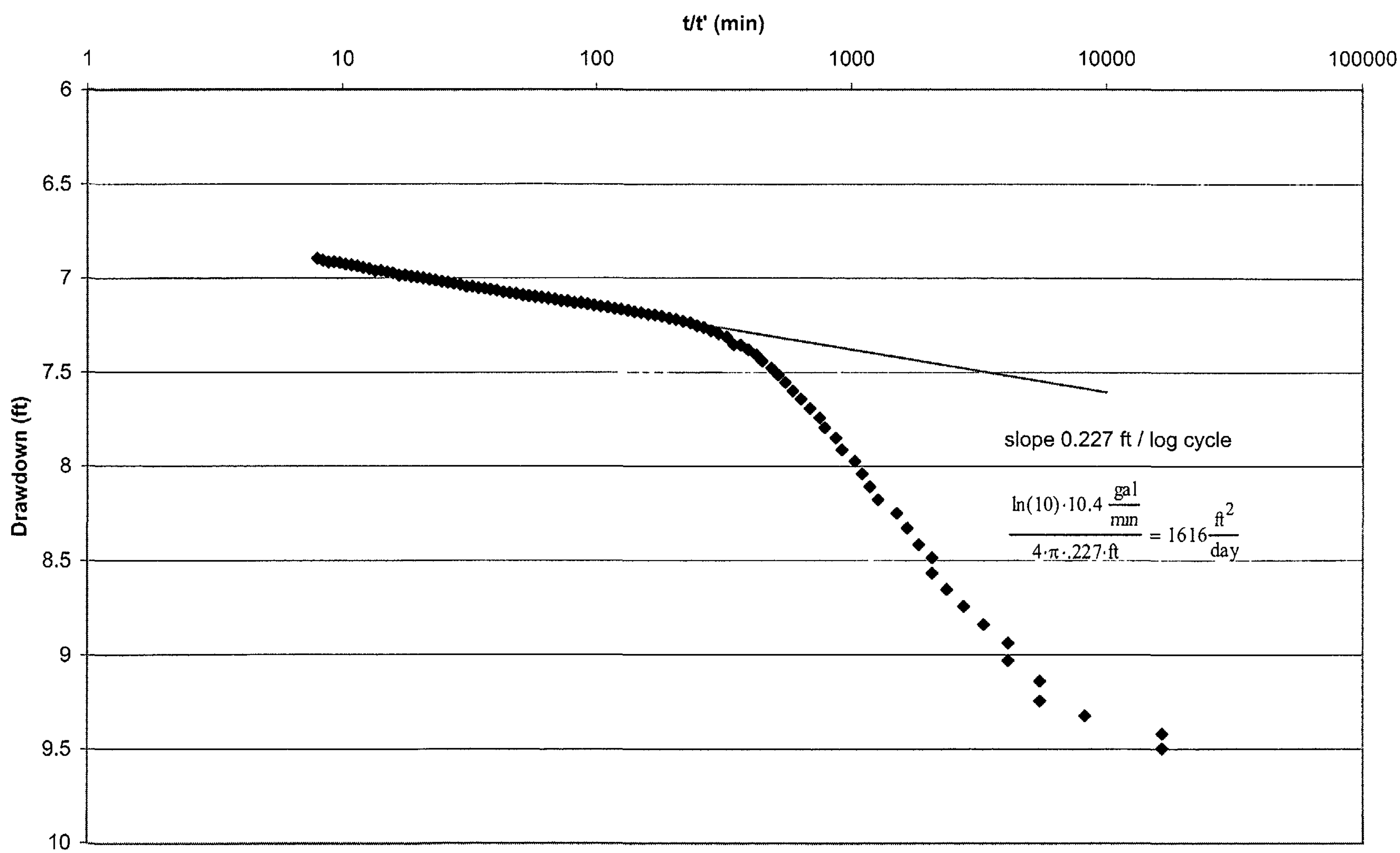
Z:\Omega\Spring_03_Test_Data\OW3_rec.xls

Figure E-3, Recovery at Well OW4a



Z:\Omega\Spring_03_Test_Data\OW4A_Rec.xls

Figure E-4, Recovery at Well OW8



Z:\Omega\Spring_03_Test_Data\OW8_rec.xls

Figure E-5, PZ-1 Pumping Phase, Neuman Analysis

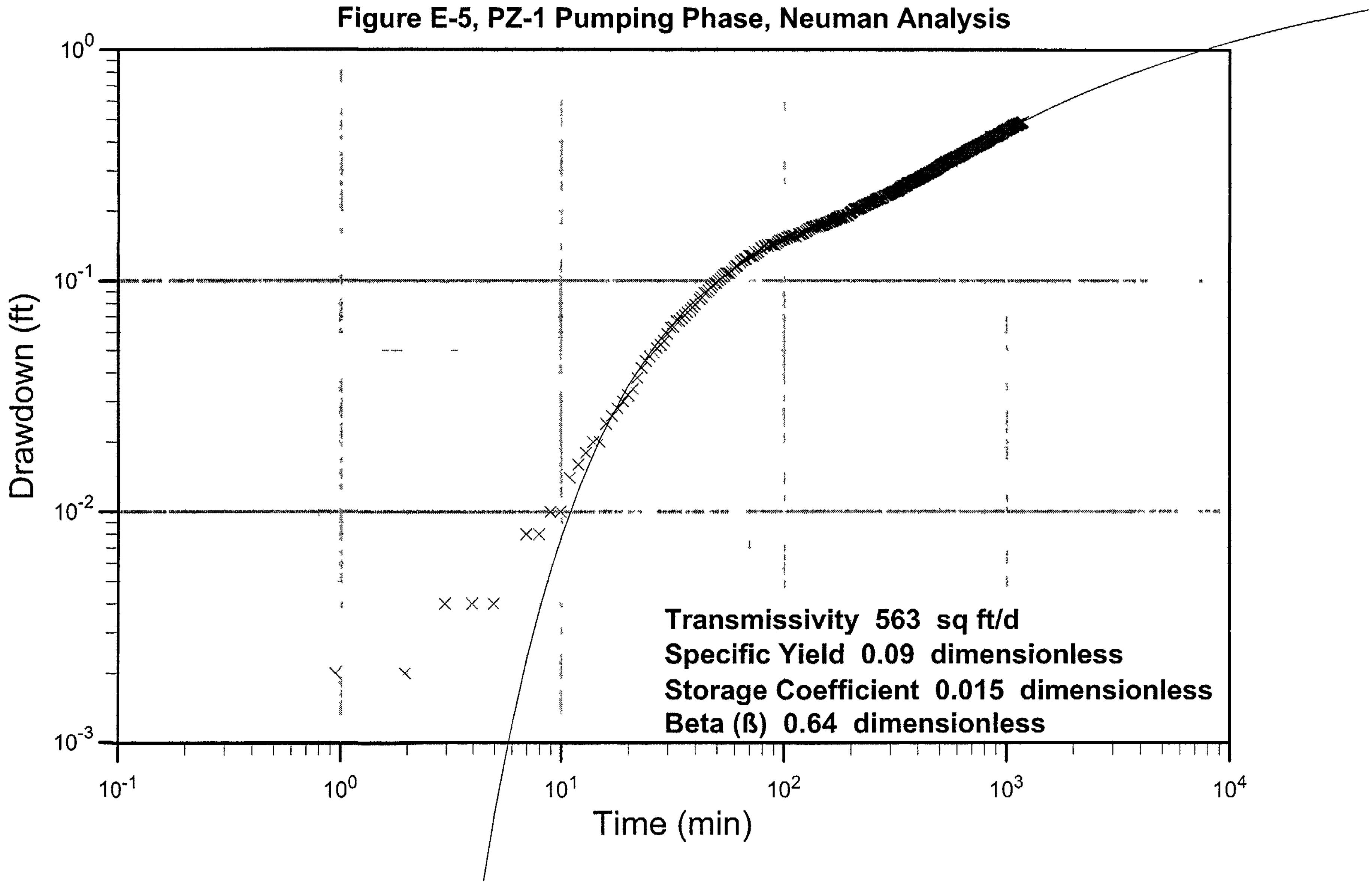


Figure E-6, PZ-2 Pumping Phase, Neuman Analysis

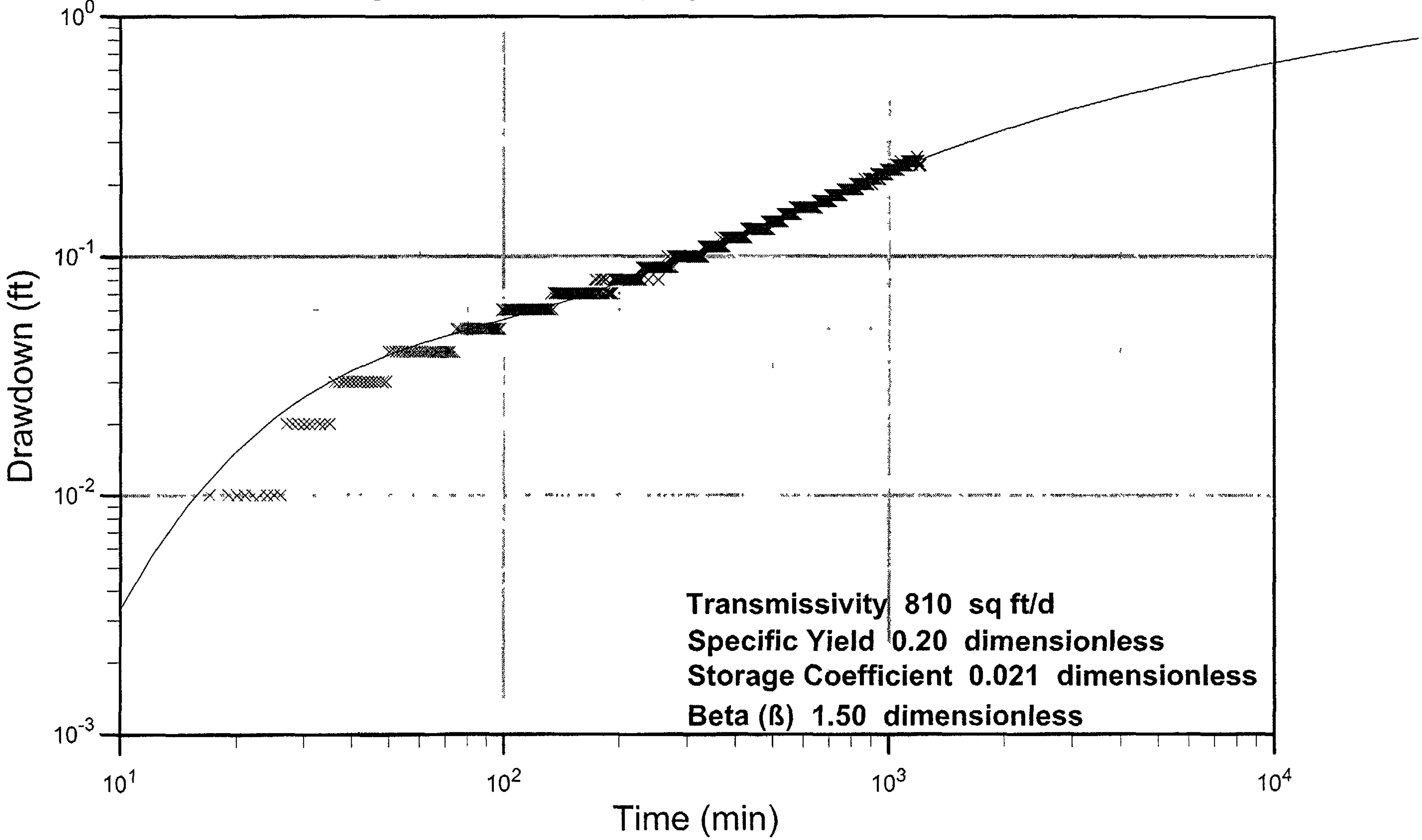


Figure E-7 Recovery at OW8 - Multi-well Test

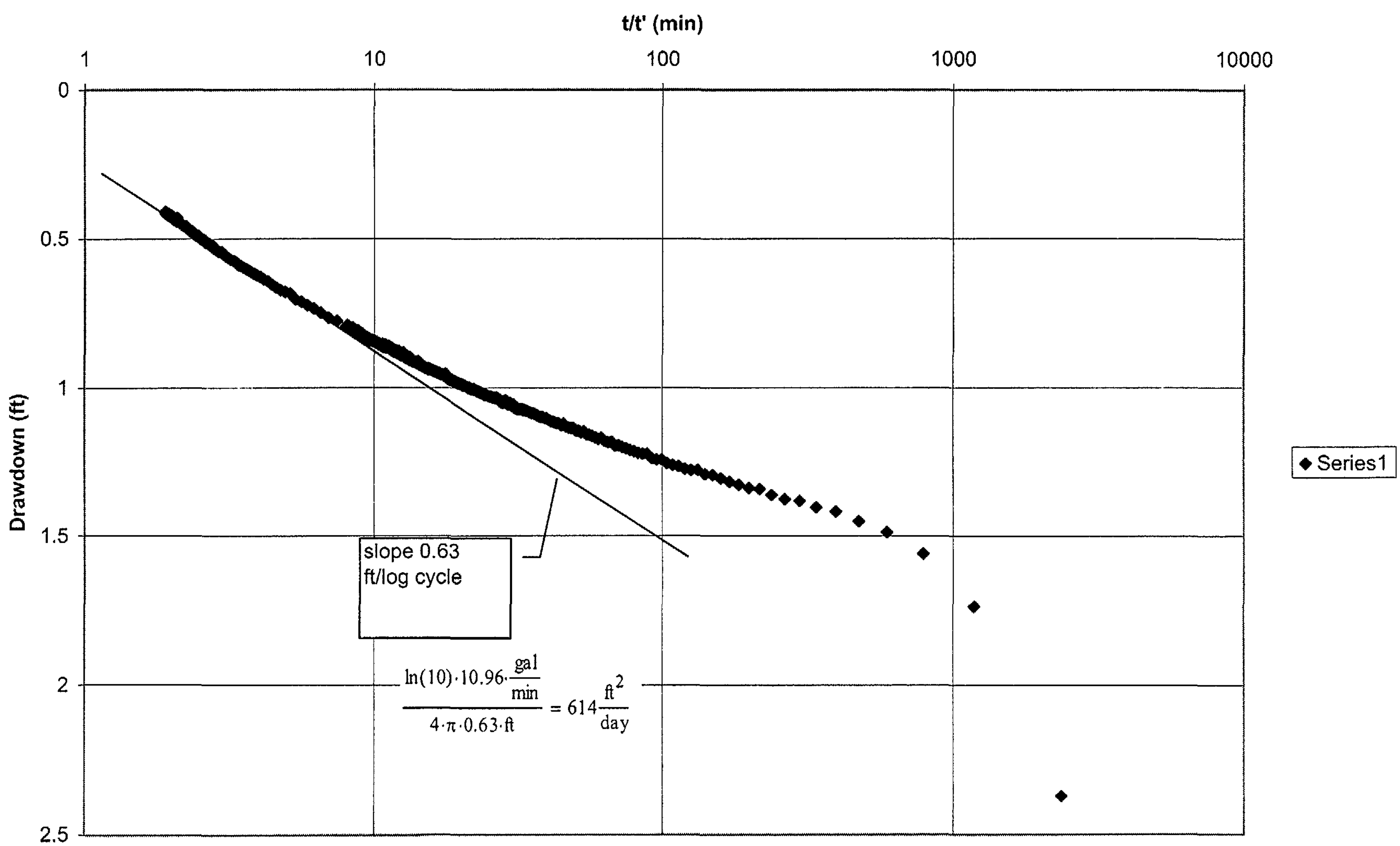
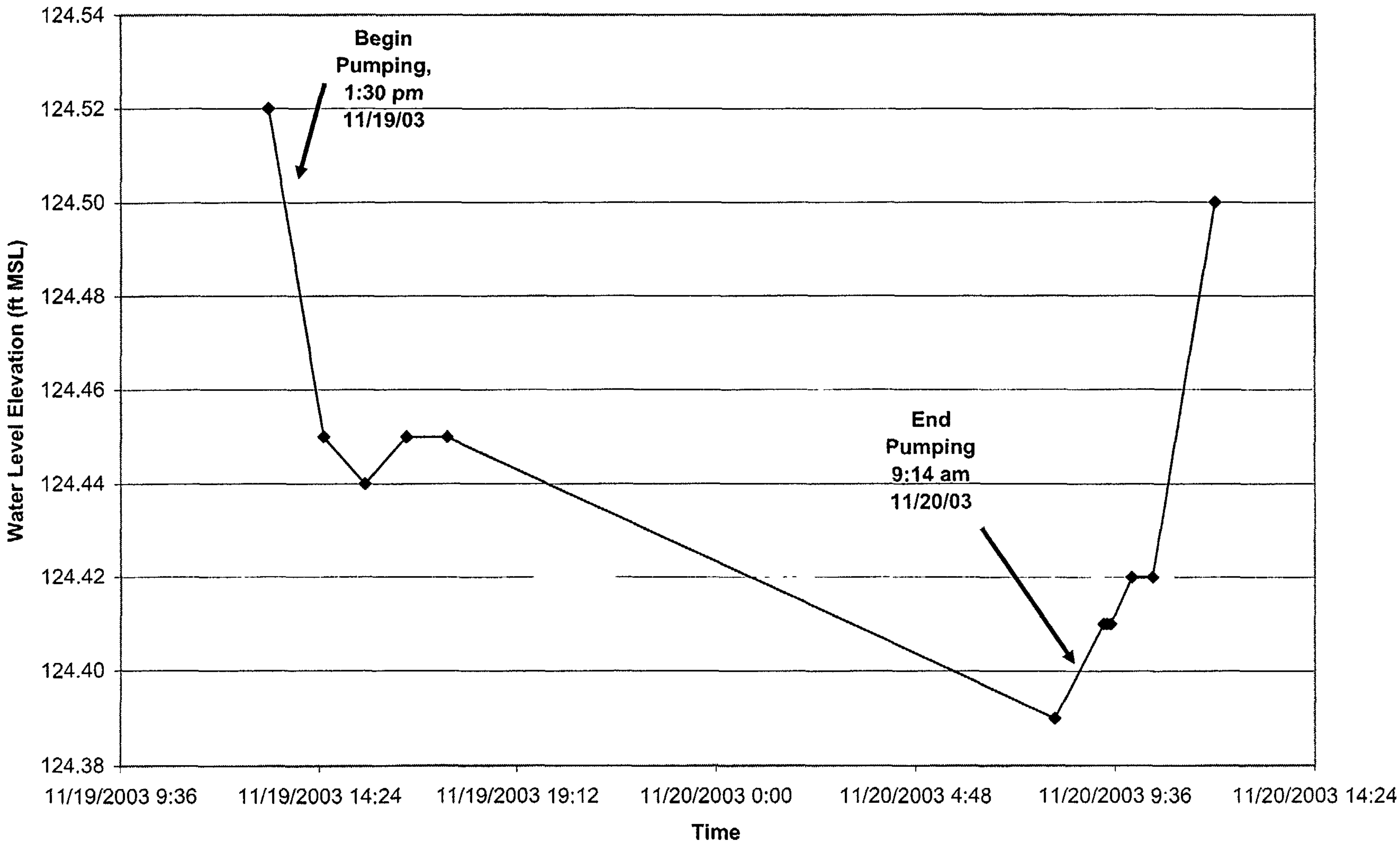
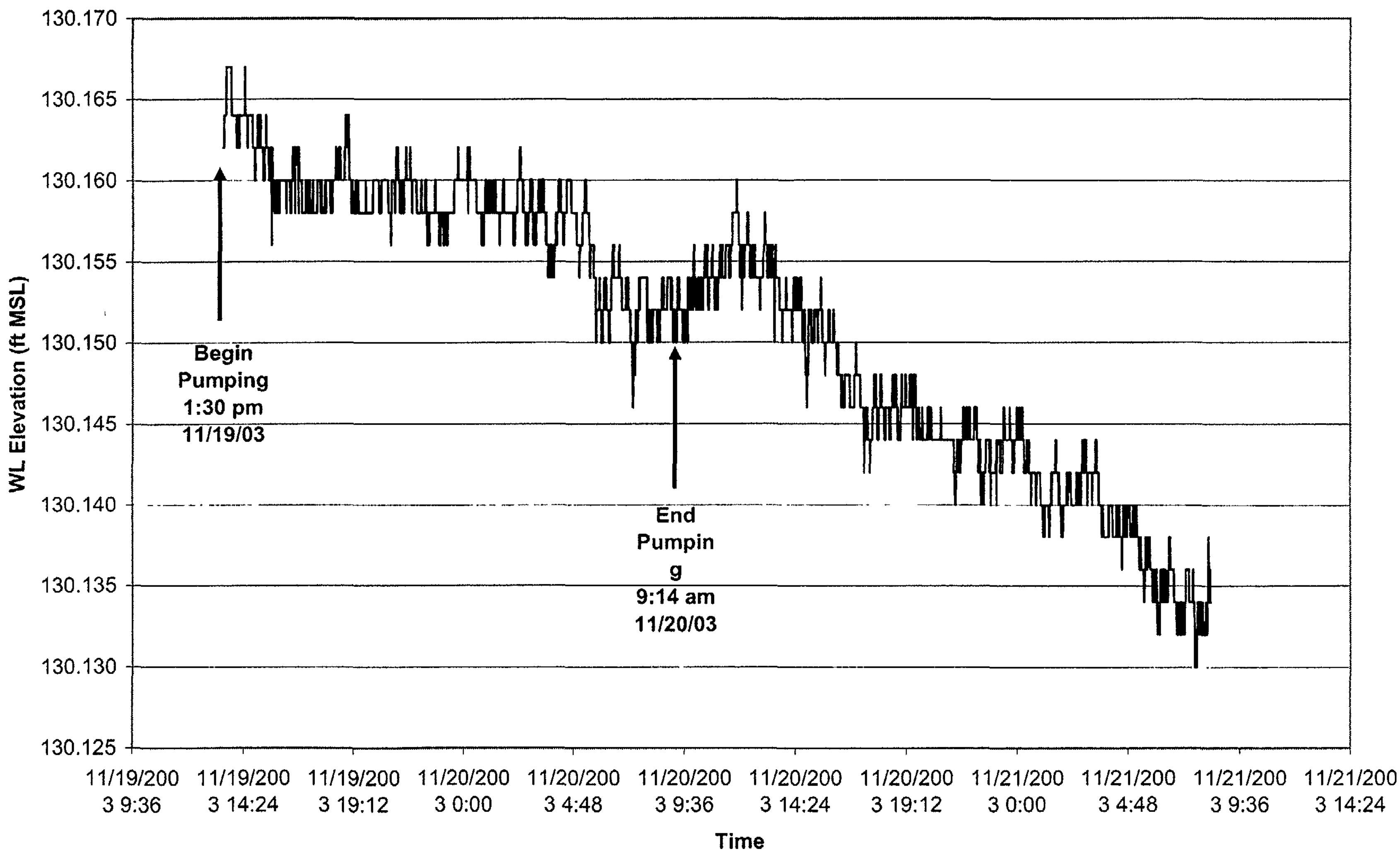


Figure E-8, OW-1b Water Level Response During Test at OW-8



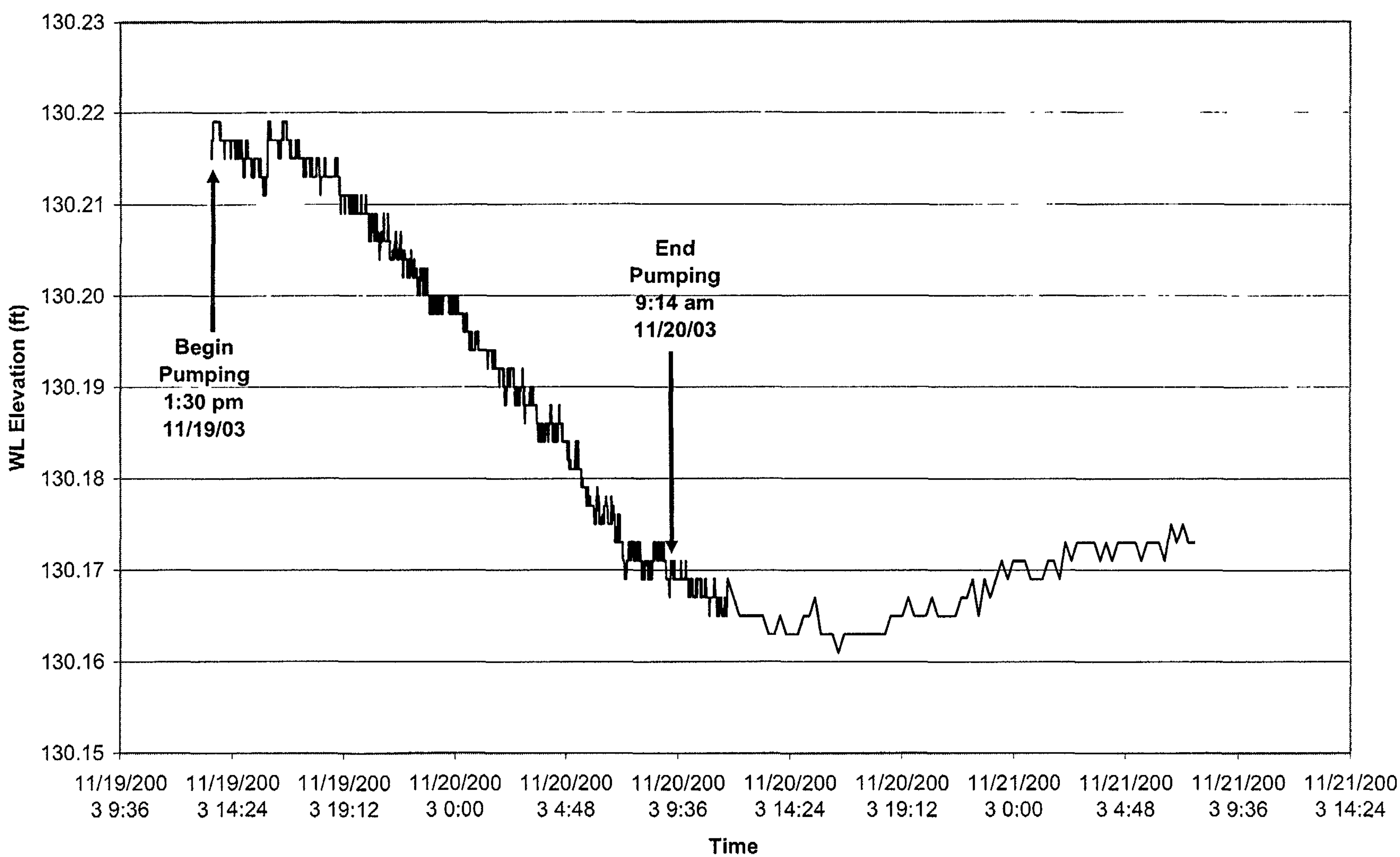
Z:\Omega\Working\WL_DataE8_E13.xls

Figure E-9, OW-2 Water Level Response During Test at OW-8



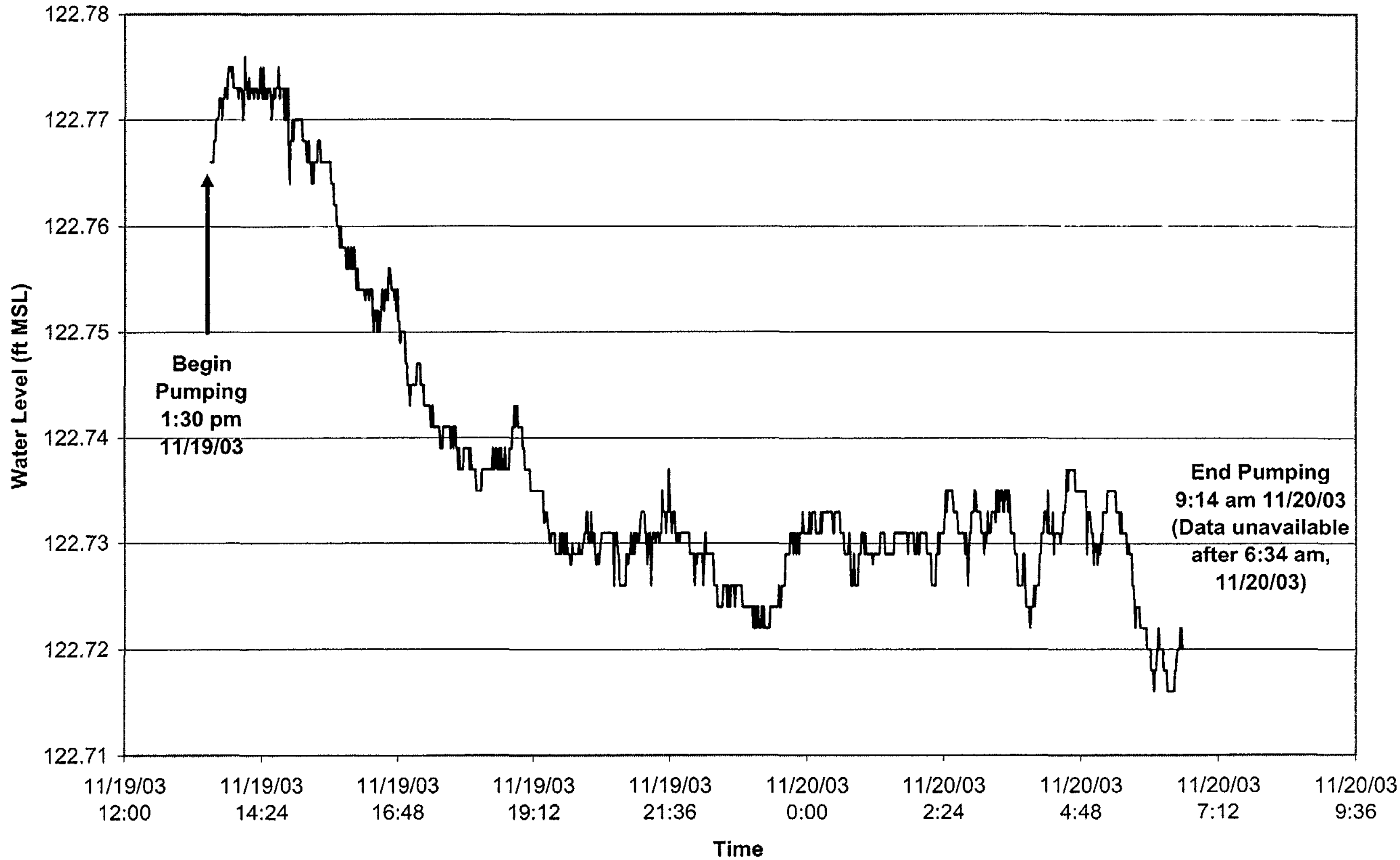
Z:\Omega\Working\WL_DataE8_E13.xls

Figure E-10, OW-3 Water Level Response During Test at OW-8



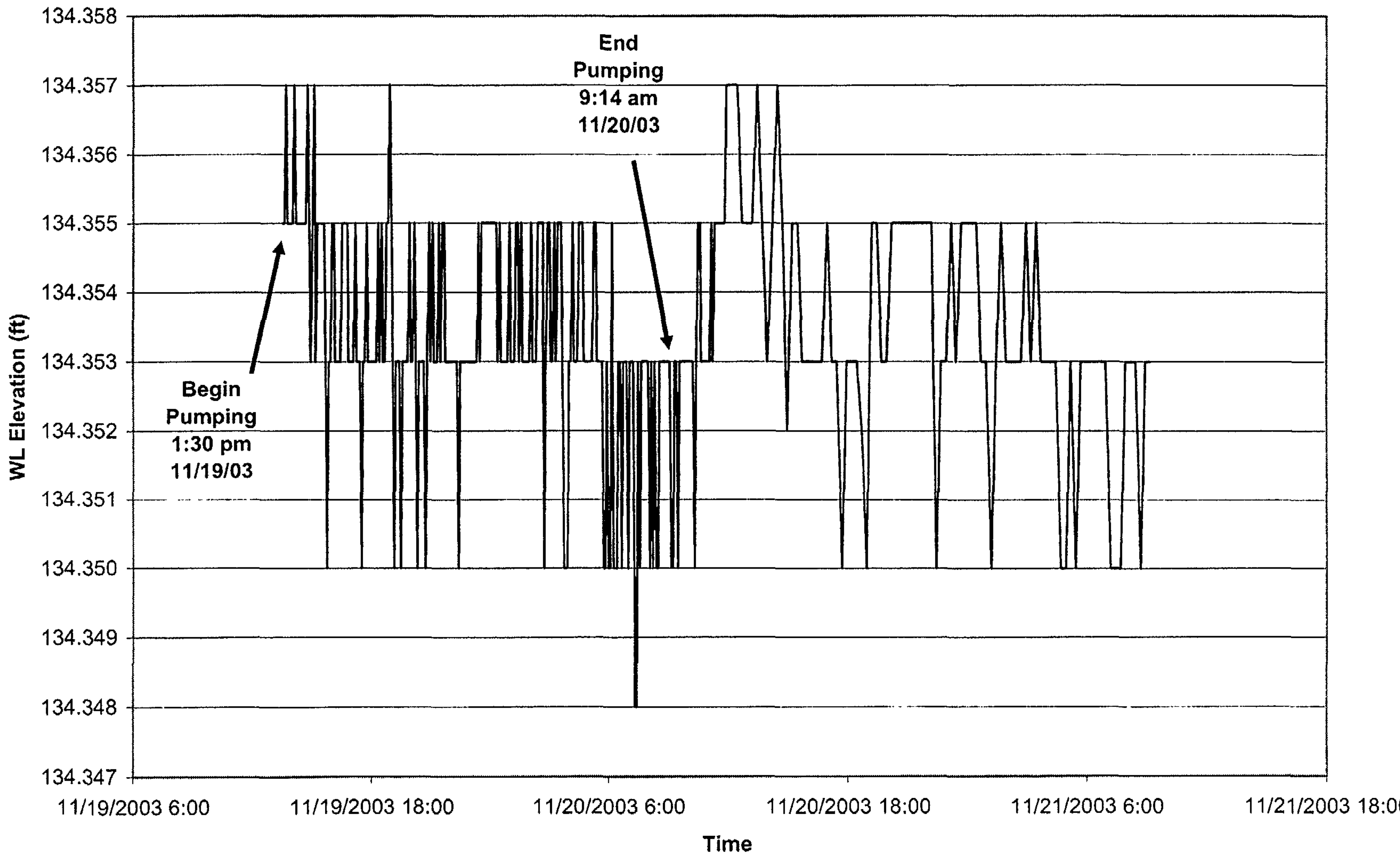
Z:\Omega\Working\WL_DataE8_E13 xls

Figure E-11, OW-4a Water Level Response During Test at OW-8



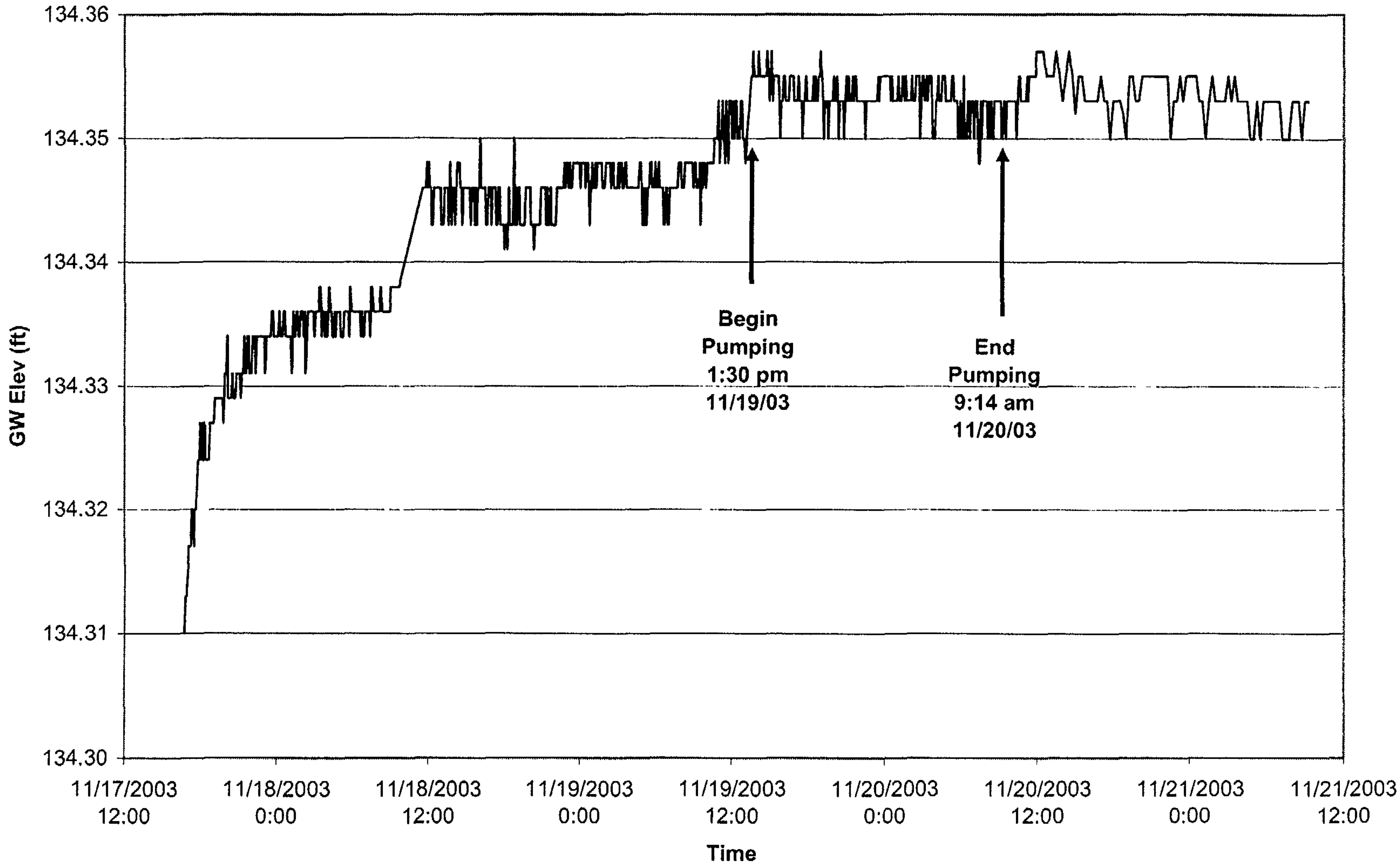
Z:\Omega\Working\WL_DataE8_E13.xls

Figure E-12, OW-7 Water Level Response During Test at OW-8



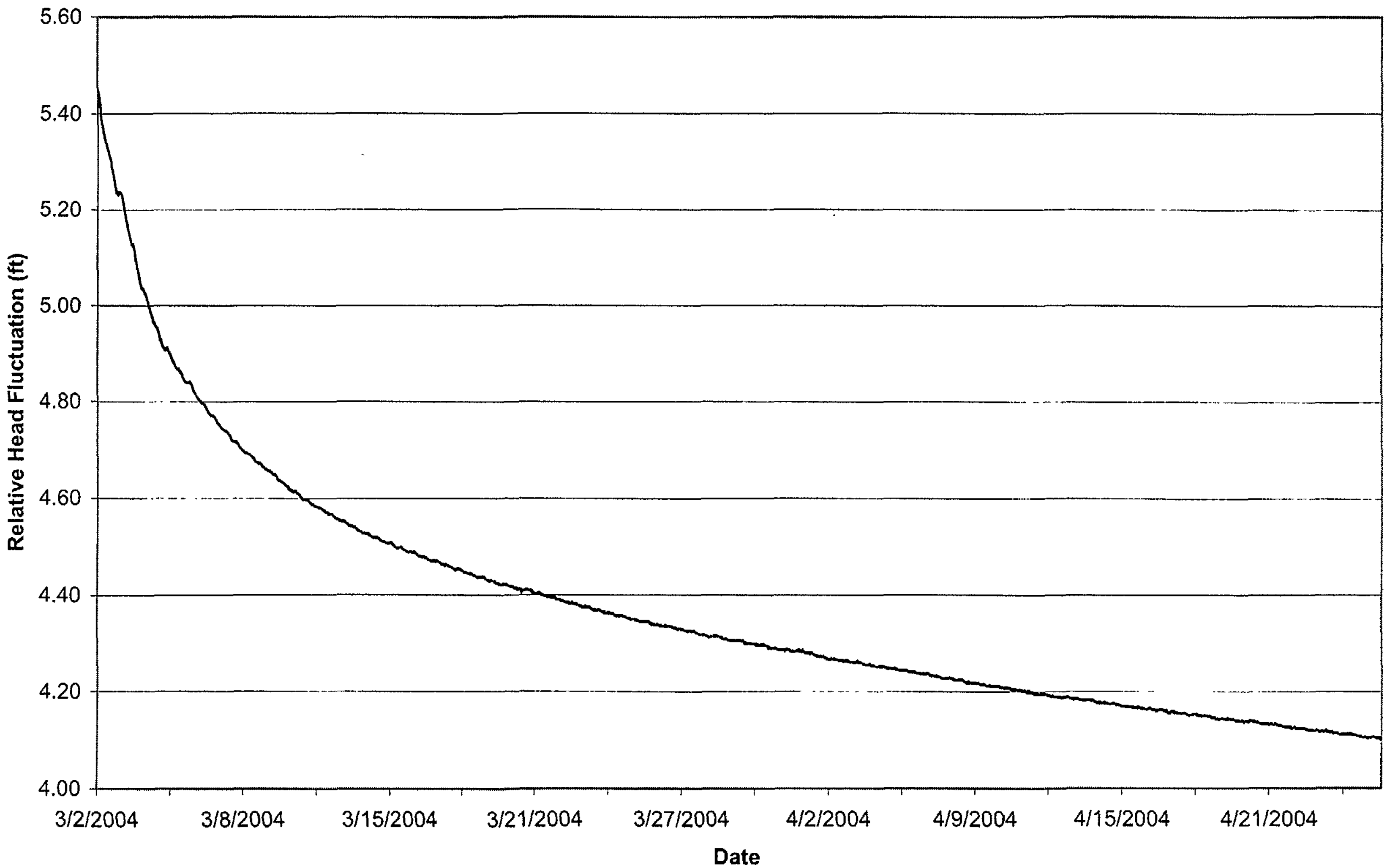
Z:\Omega\Working\WL_DataE8_E13.xls

Figure E-13, OW-7 Background Water Level Monitoring in November 2003



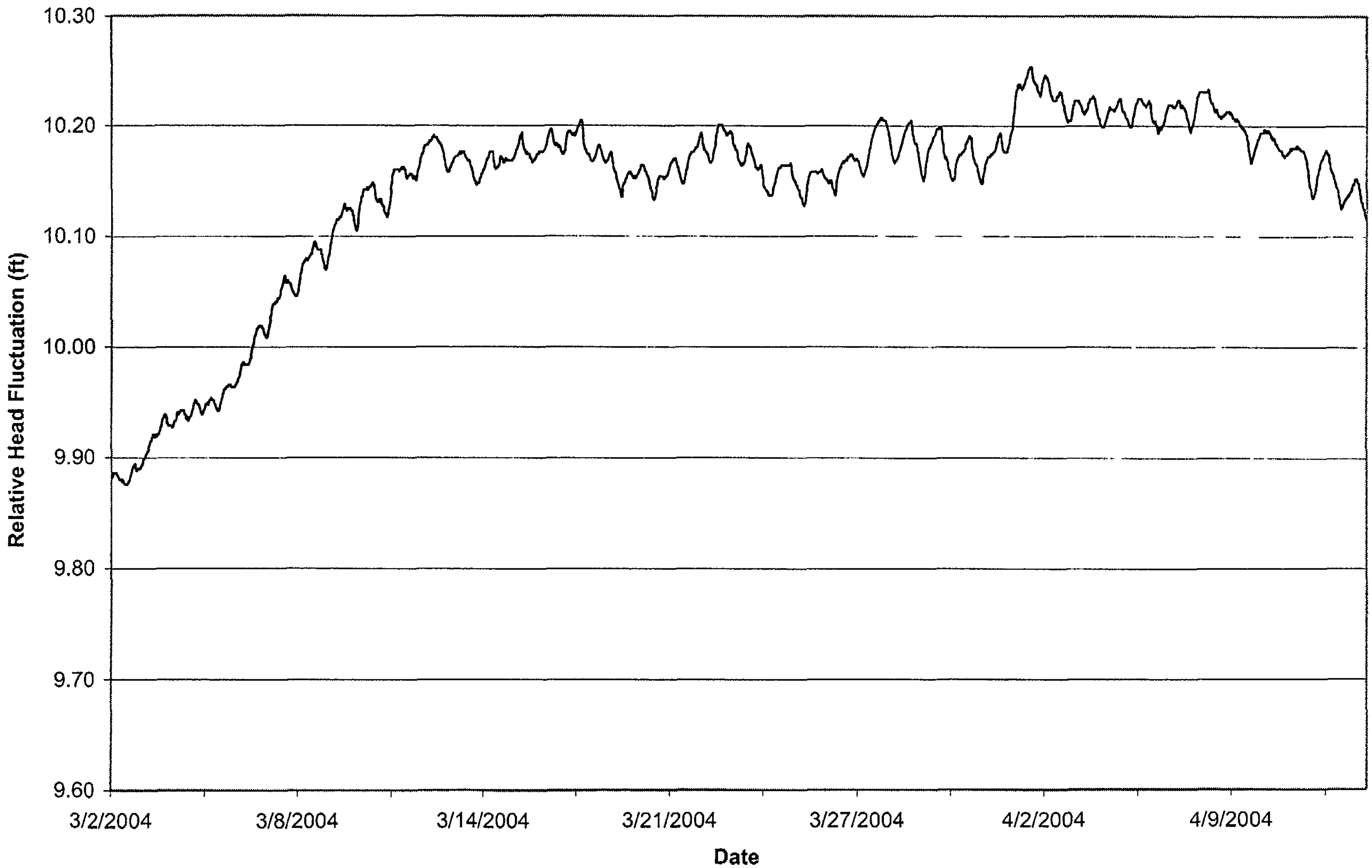
Z:\Omega\Working\WL_DataE8_E13.xls

Figure E-14, OW-1 Background Water Level Fluctuations, March-April 2004



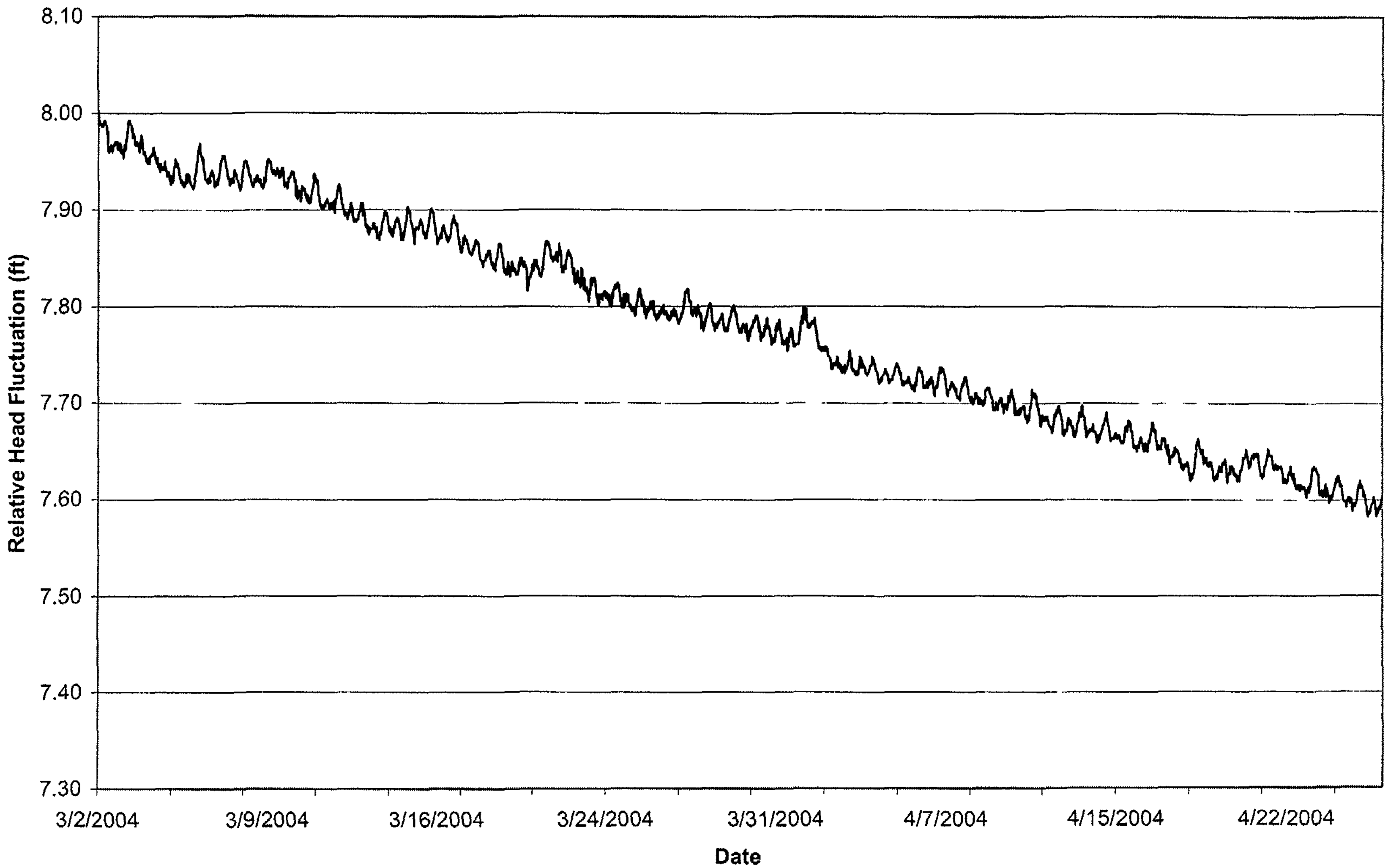
Z:\Omega\Working\Hydrographs-background.xls

Figure E-15, OW-1b Background Water Level Fluctuations, March-April 2004



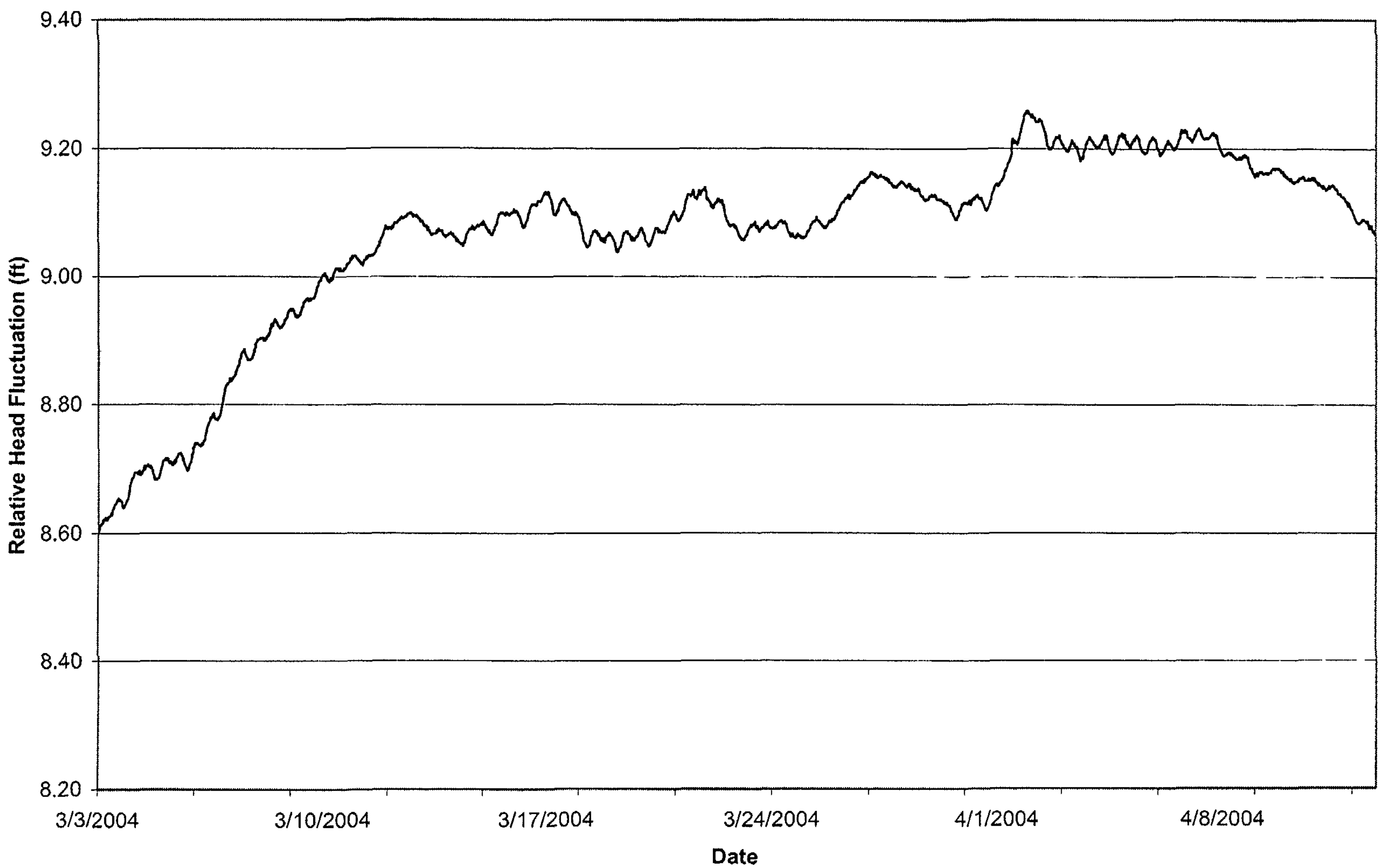
Z:\Omega\Working\Hydrographs-background.xls

Figure E-16, OW-4a Background Water Level Fluctuations, March-April 2004



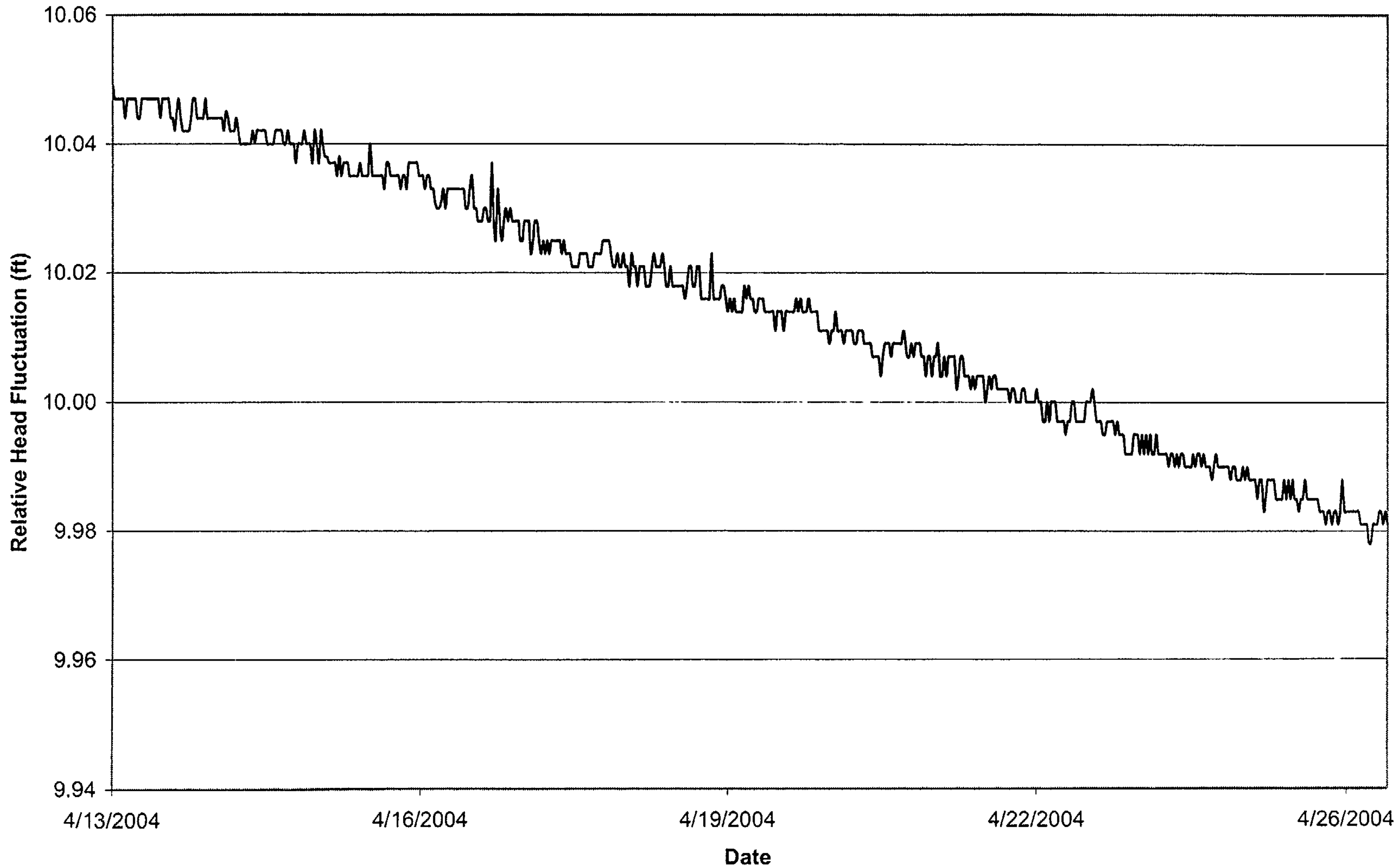
Z:\Omega\Working\Hydrographs-background xls

Figure E-17, OW-4b Background Water Level Fluctuations, March-April 2004



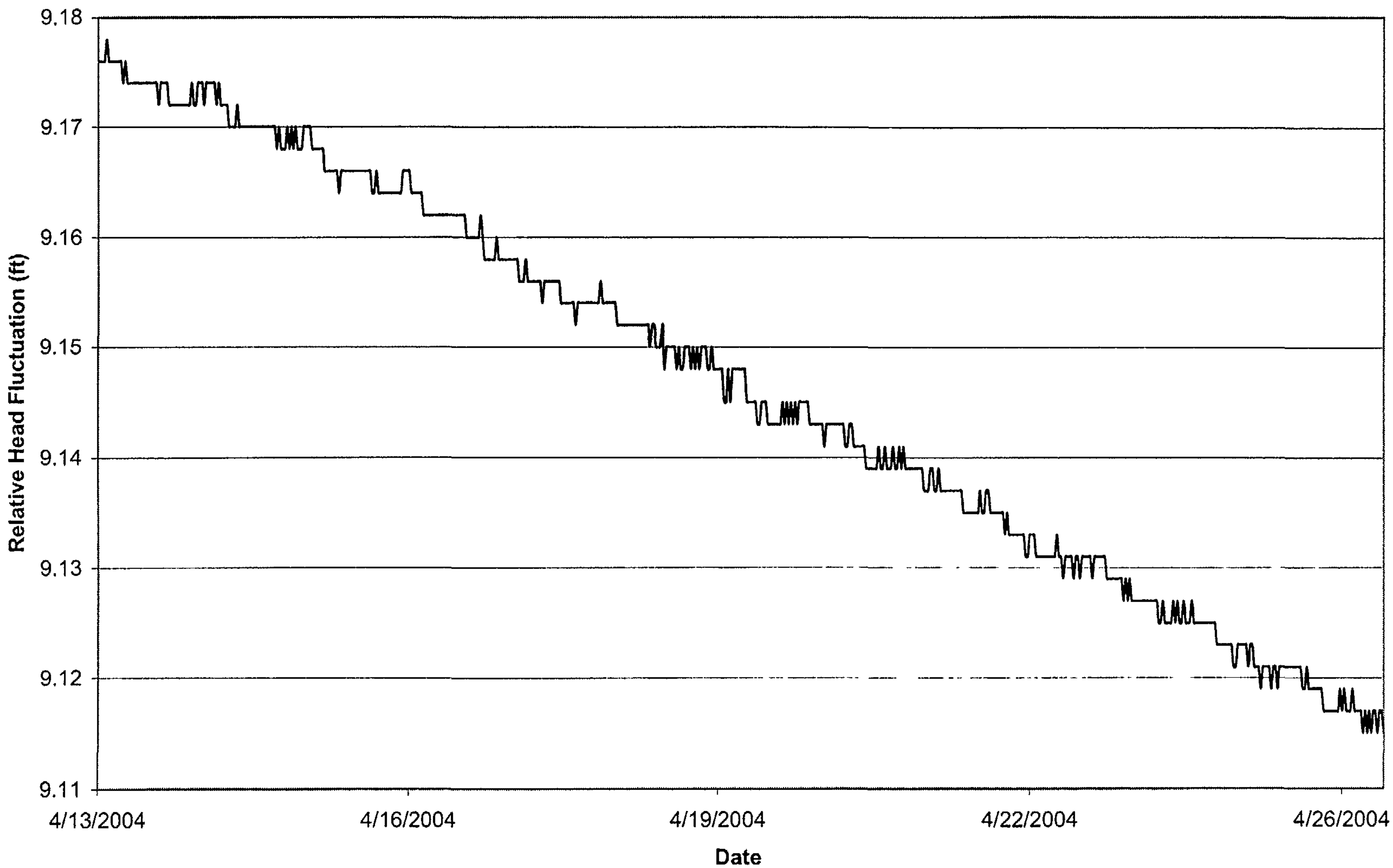
Z:\Omega\Working\Hydrographs-background.xls

Figure E-18, OW-7 Background Water Level Fluctuations, April 2004



Z:\Omega\Working\Hydrographs-background.xls

Figure E-19, OW-8 Background Water Level Fluctuations, April 2004



Z:\Omega\Working\Hydrographs-background.xls

Appendix F
Fate and Transport

Figure F-1 - Chloroethenes

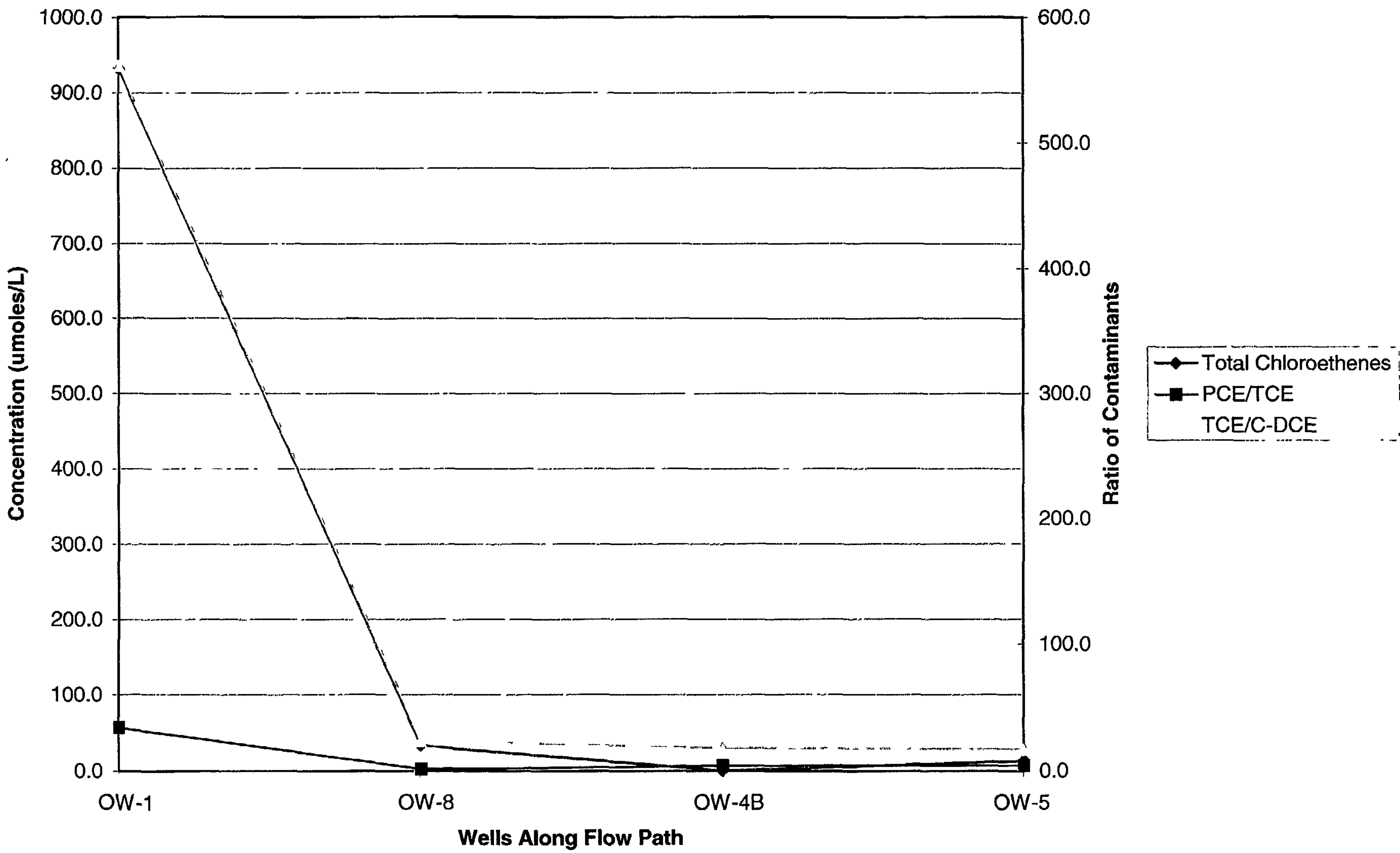
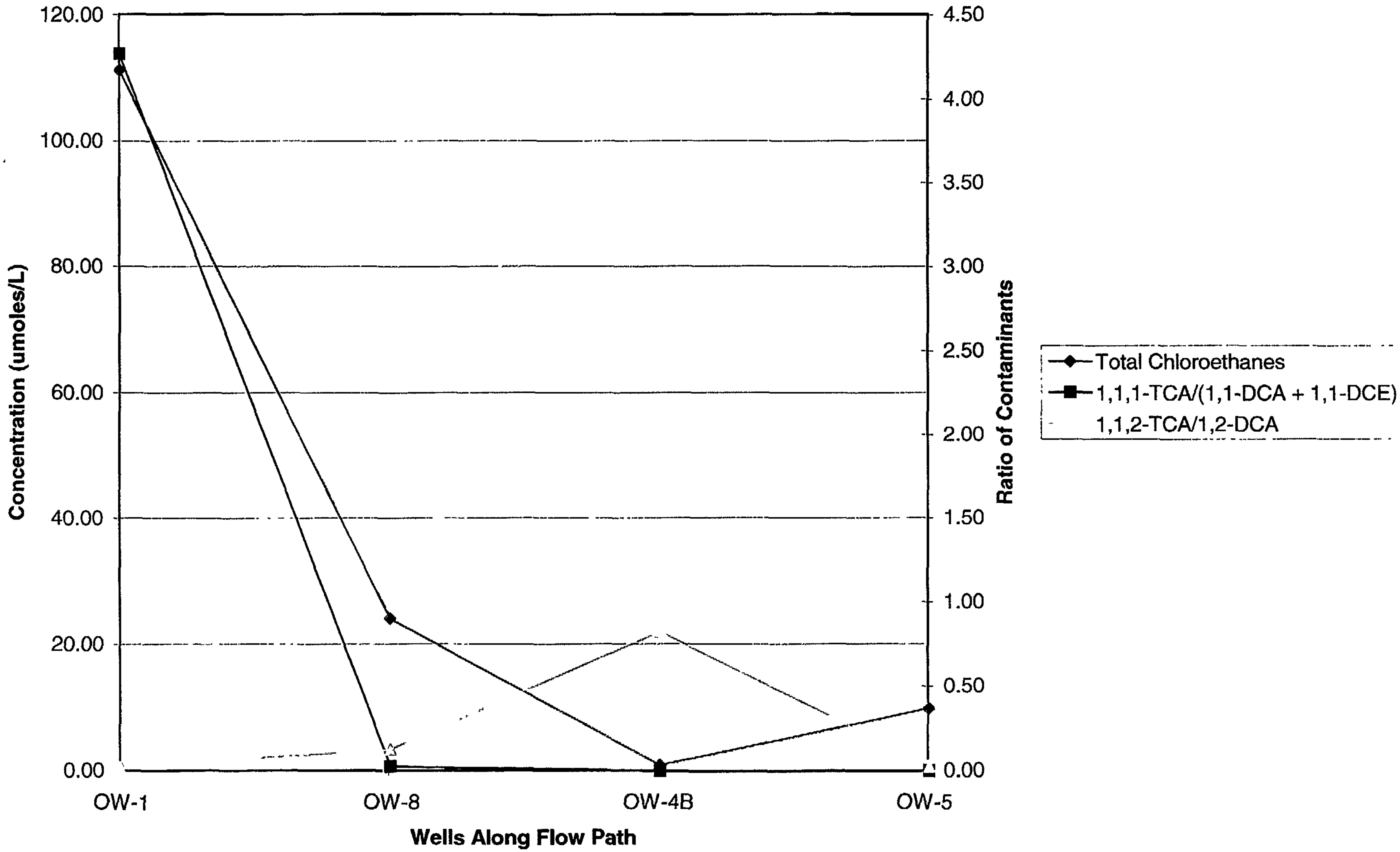


Figure F-2 - Chloroethanes



Table

Flow path		
	OW-1	OW-1B
	OW-8	OW-4B
	OW-2	
	OW-3	
	OW-4A	
	OW-5	

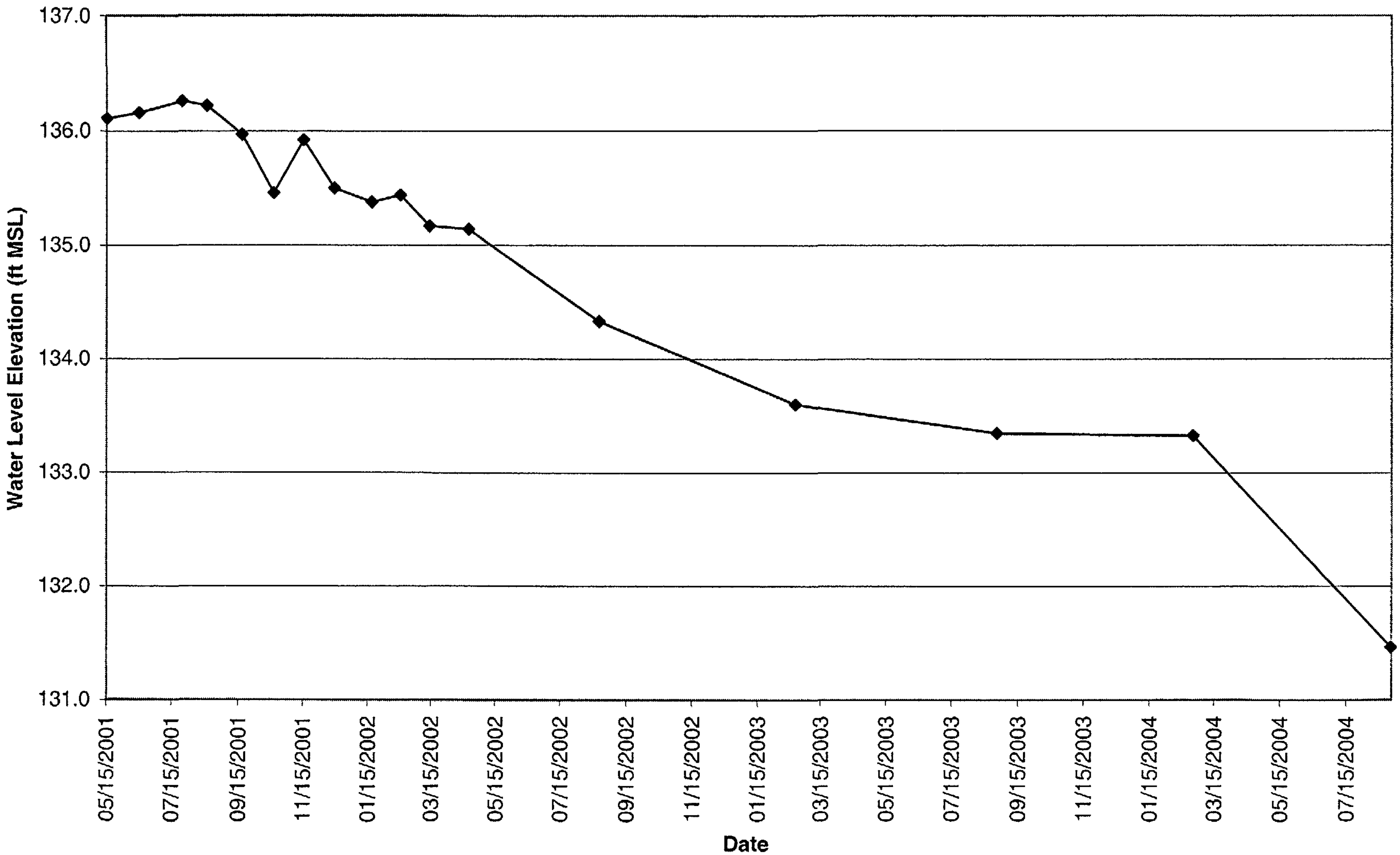
OW-1	150000	3500	4.6		904.5	26.6	0.0	931.2		34.0	561.4					
OW-8	3400	1600	50		20.5	12.2	0.5	33.2		1.7	23.6					
OW-4A	68	12	0.5		0.4	0.1	0.0	0.5		4.5	17.7					
OW-5	1800	320	14		10.9	2.4	0.1	13.4		4.5	16.9					
OW-1B	87	2.8	0.5		0.5	0.0	0.0	0.6		24.6	4.1					
OW-4B	1.6	0.5	0.5		0.0	0.0	0.0	0.0		2.5	0.7					

								PCA umole/L		umole/L						
OW-1	5.3	12000	0.35	45	12	2000		0.03	89.95	0.00	0.45	0.12	20.63	111.19	4.27	0.02
OW-8	50	51	130	110	780	1300		0.30	0.38	0.97	1.11	7.88	13.41	24.06	0.03	0.12
OW-4A	0.5	0.3	0.5	0.5	0.45	79		0.00	0.00	0.00	0.01	0.00	0.81	0.83	0.00	0.82
OW-5	0.5	2.6	1.2	5.1	33	910		0.00	0.02	0.01	0.05	0.33	9.39	9.80	0.00	0.03
OW-1B	0.5	0.84	0.5	0.5	0.41	2.2		0.00	0.01	0.00	0.01	0.00	0.02	0.04	0.23	0.90
OW-4B	0.5	0.5	0.5	0.5	0.25	0.5		0.00	0.00	0.00	0.01	0.00	0.01	0.02	0.37	1.48

value indicated is one-half the reporting limit

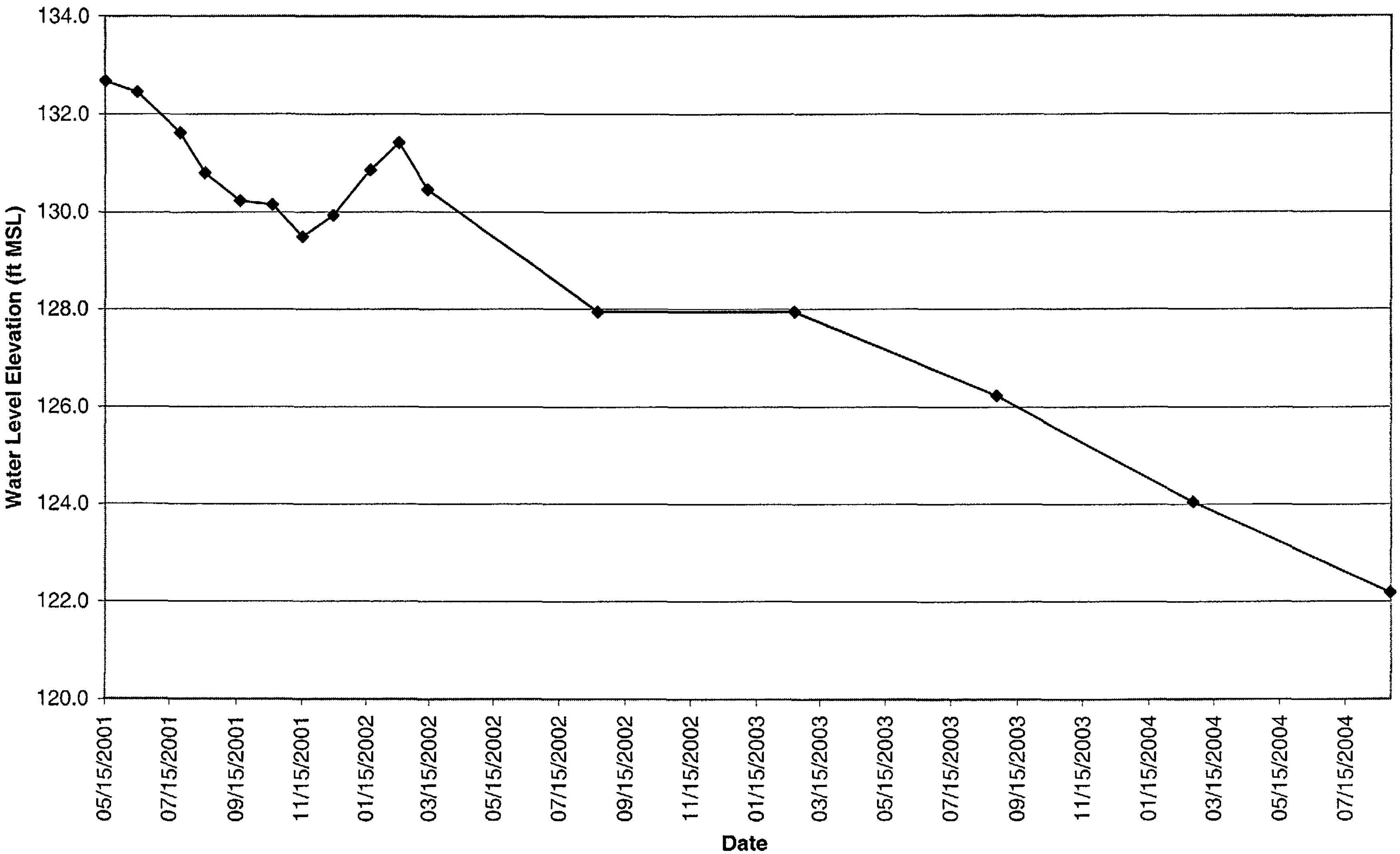
Appendix G
Hydrographs and Time-Series Plots

Figure G-1, OW-1 Hydrograph 5/15/2001-8/25/2004



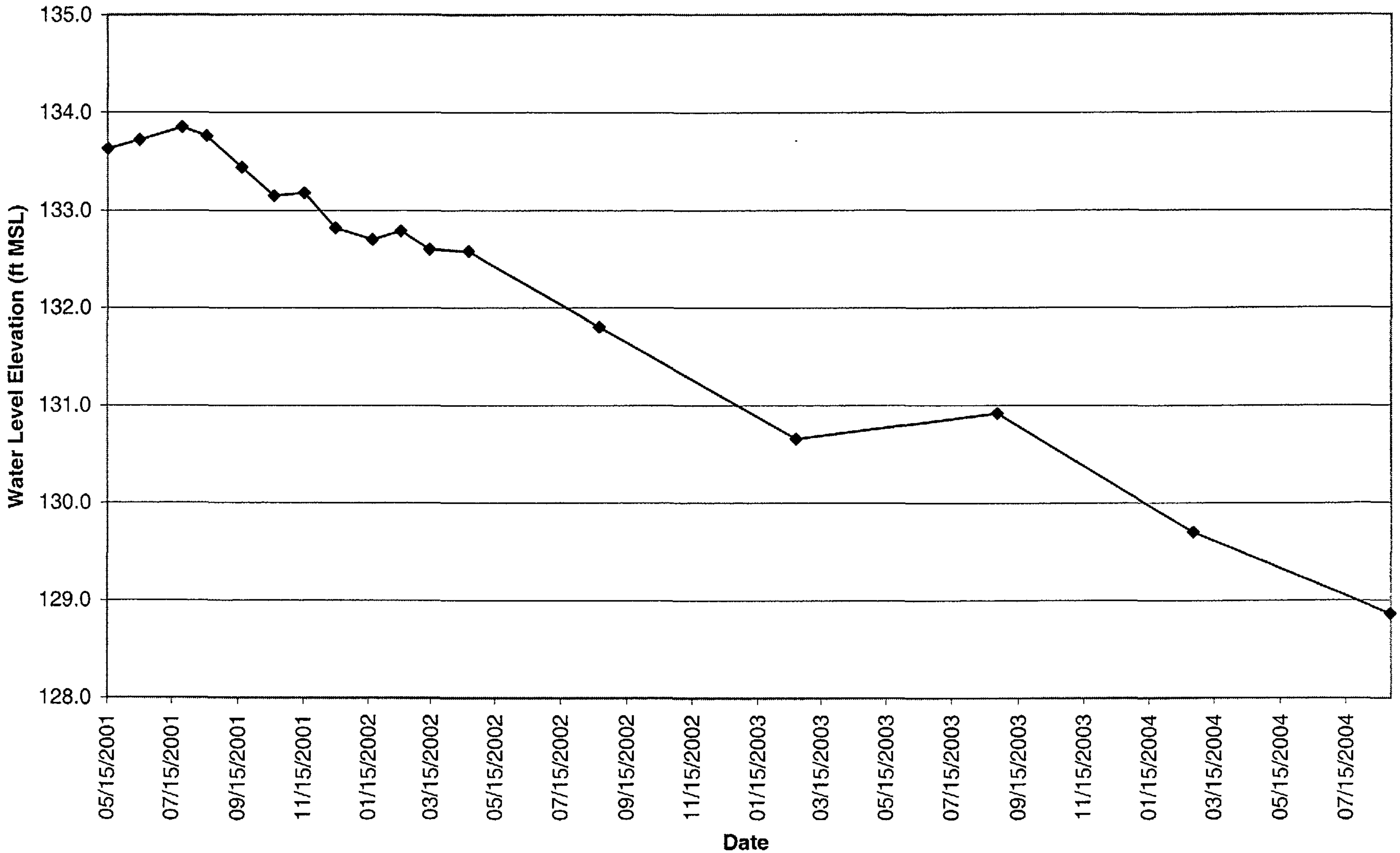
P:\10500\Reports\Phase1a Rept Addendum\Revised 2004\AppG-HGraphs_T-SPlots\App_G_Hydrographs.xls

Figure G-2, OW-1B Hydrograph 5/15/2001-8/25/2004



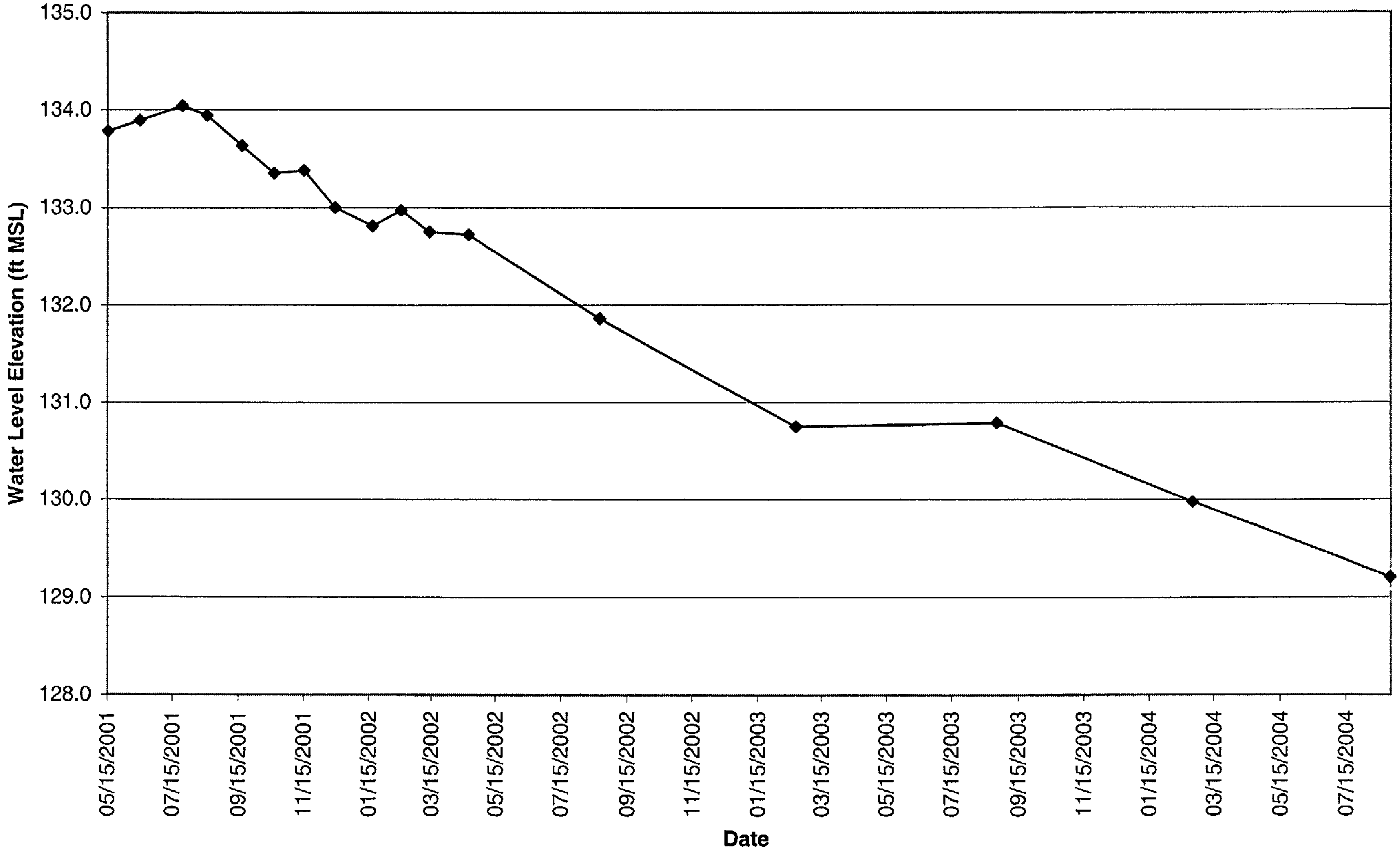
P:\10500\Reports\Phase1a Rept Addendum\Revised 2004\AppG-HGraphs_T-SPlots\App_G_Hydrographs.xls

Figure G-3, OW-2 Hydrograph 5/15/2001-8/25/2004



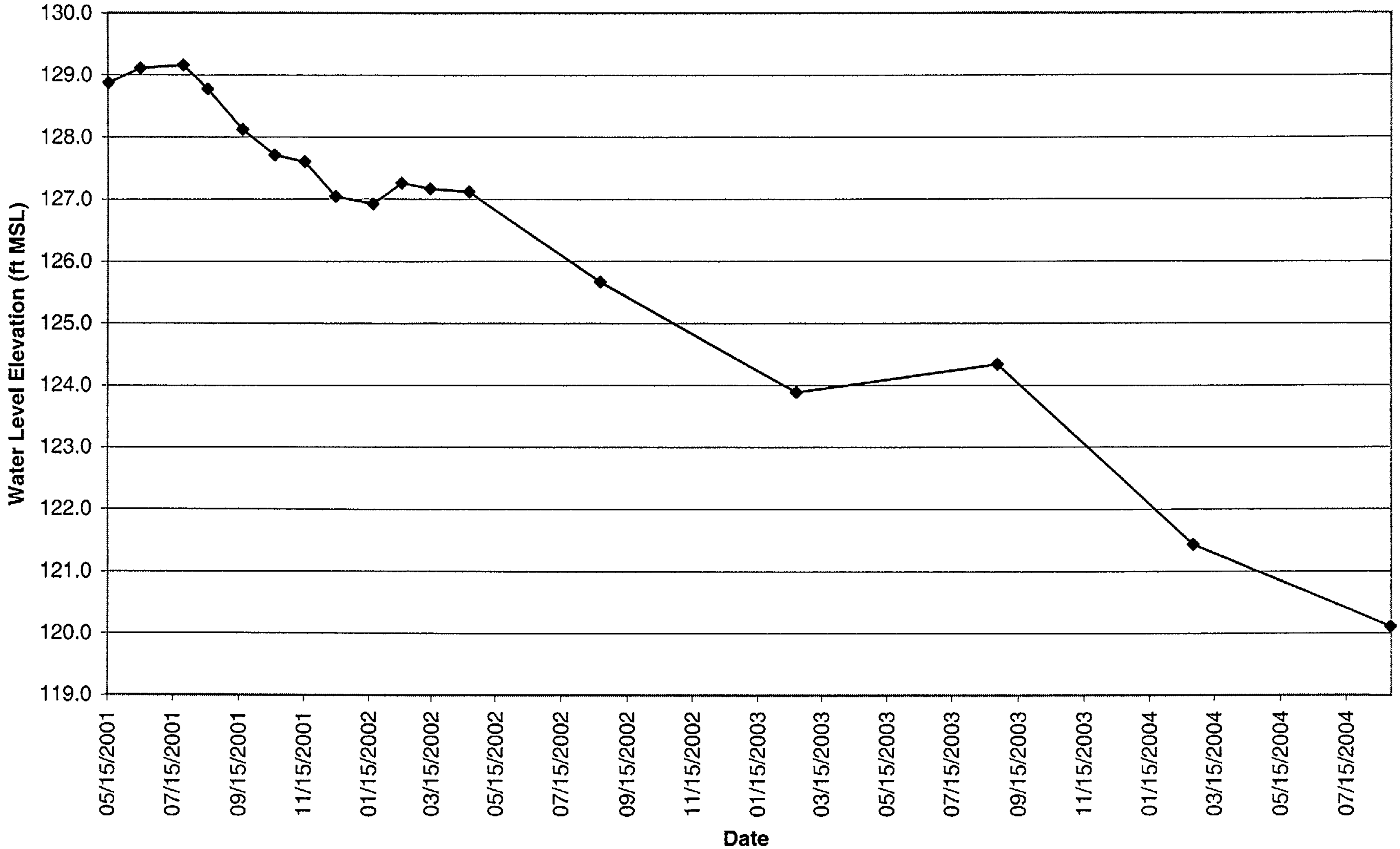
P:\10500\Reports\Phase1a Rept Addendum\Revised 2004\AppG-HGraphs_T-SPlots\App_G_Hydrographs.xls

Figure G-4, OW-3 Hydrograph 5/15/2001-8/25/2004



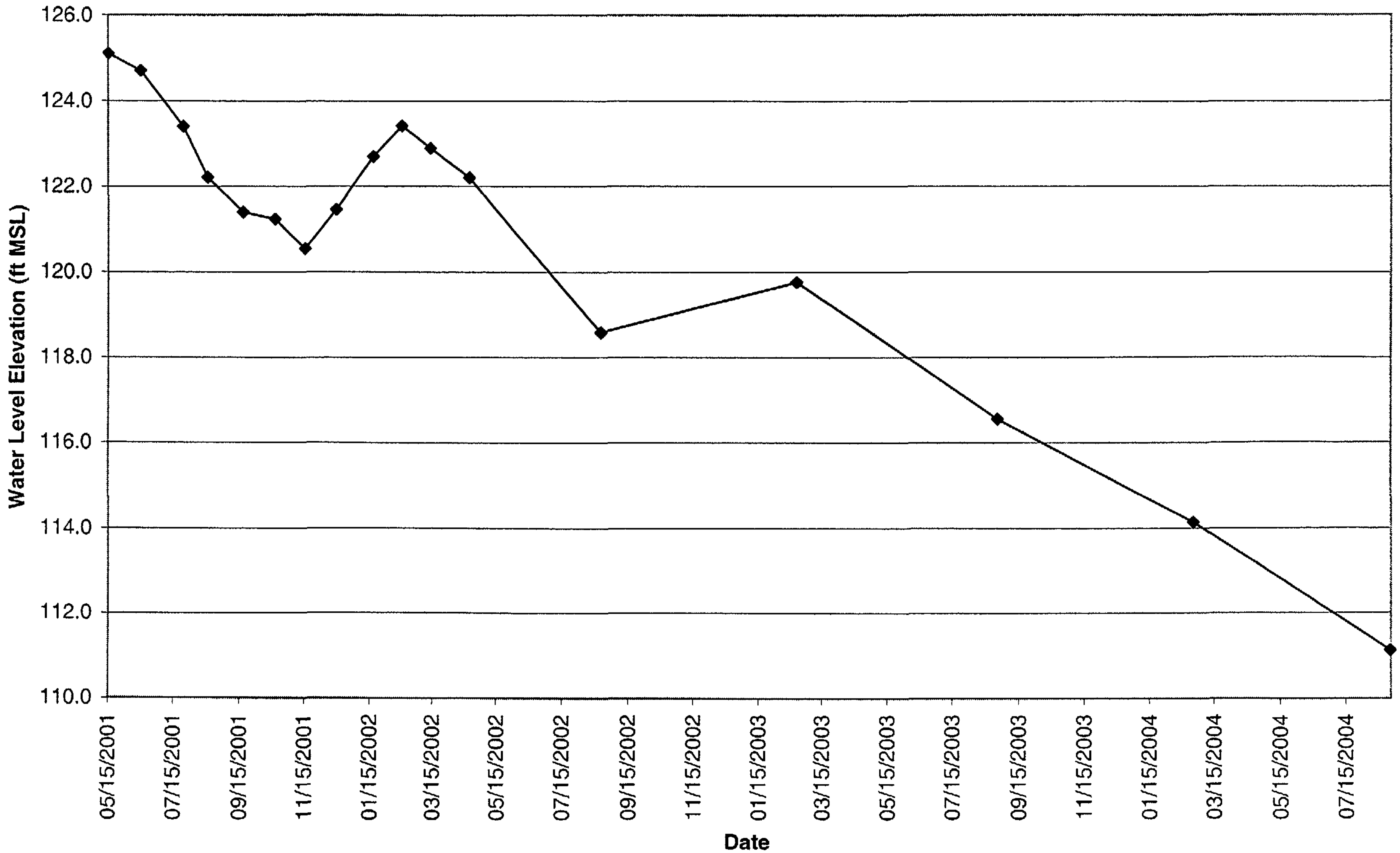
P:\10500\Reports\Phase1a Rept Addendum\Revised 2004\AppG-HGraphs_T-SPlots\App_G_Hydrographs.xls

Figure G-5, OW-4A Hydrograph 5/15/2001-8/25/2004



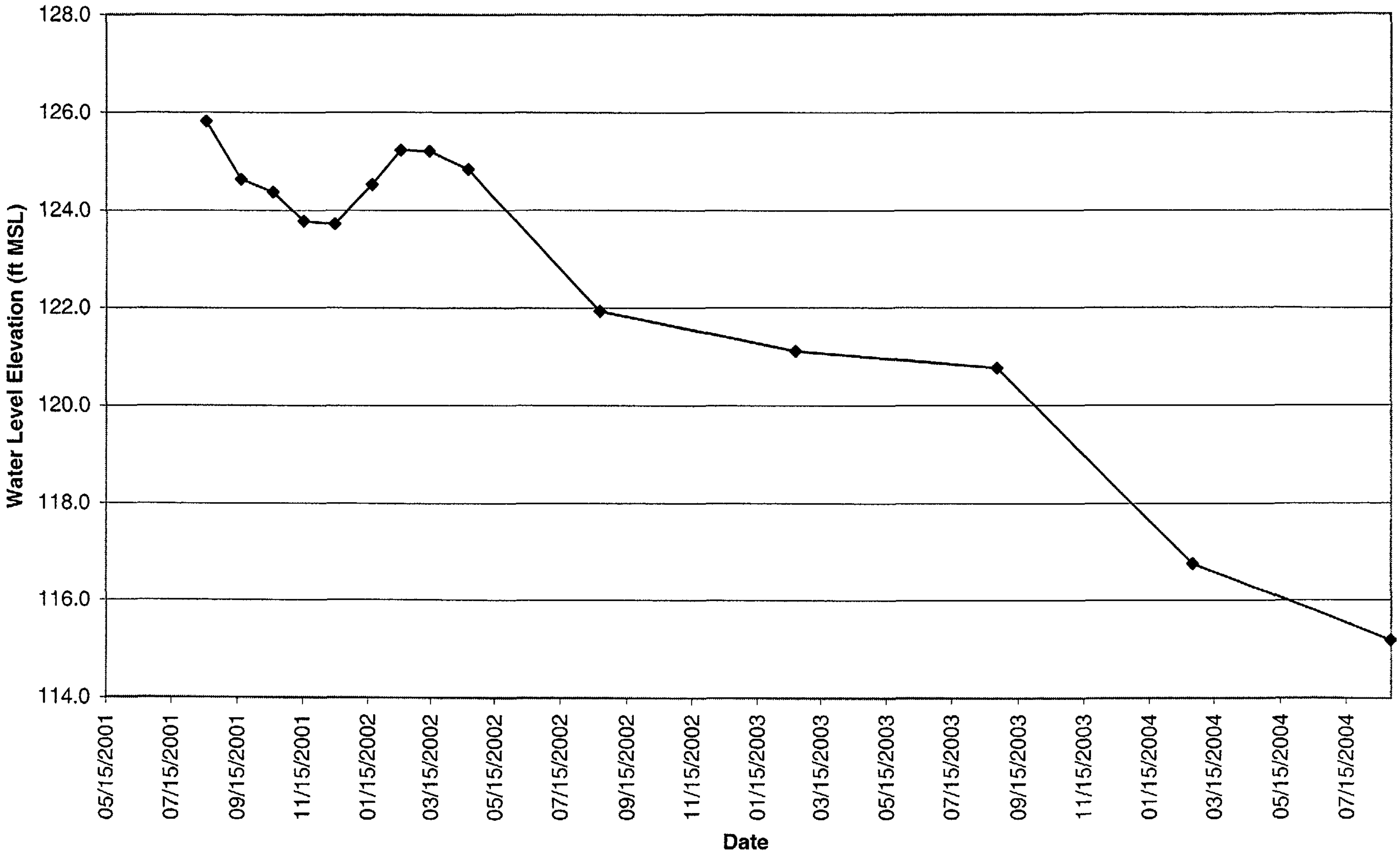
P:\10500\Reports\Phase1a Rept Addendum\Revised 2004\AppG-HGraphs_T-SPlots\App_G_Hydrographs.xls

Figure G-6, OW-4B Hydrograph 5/15/2001-8/25/2004



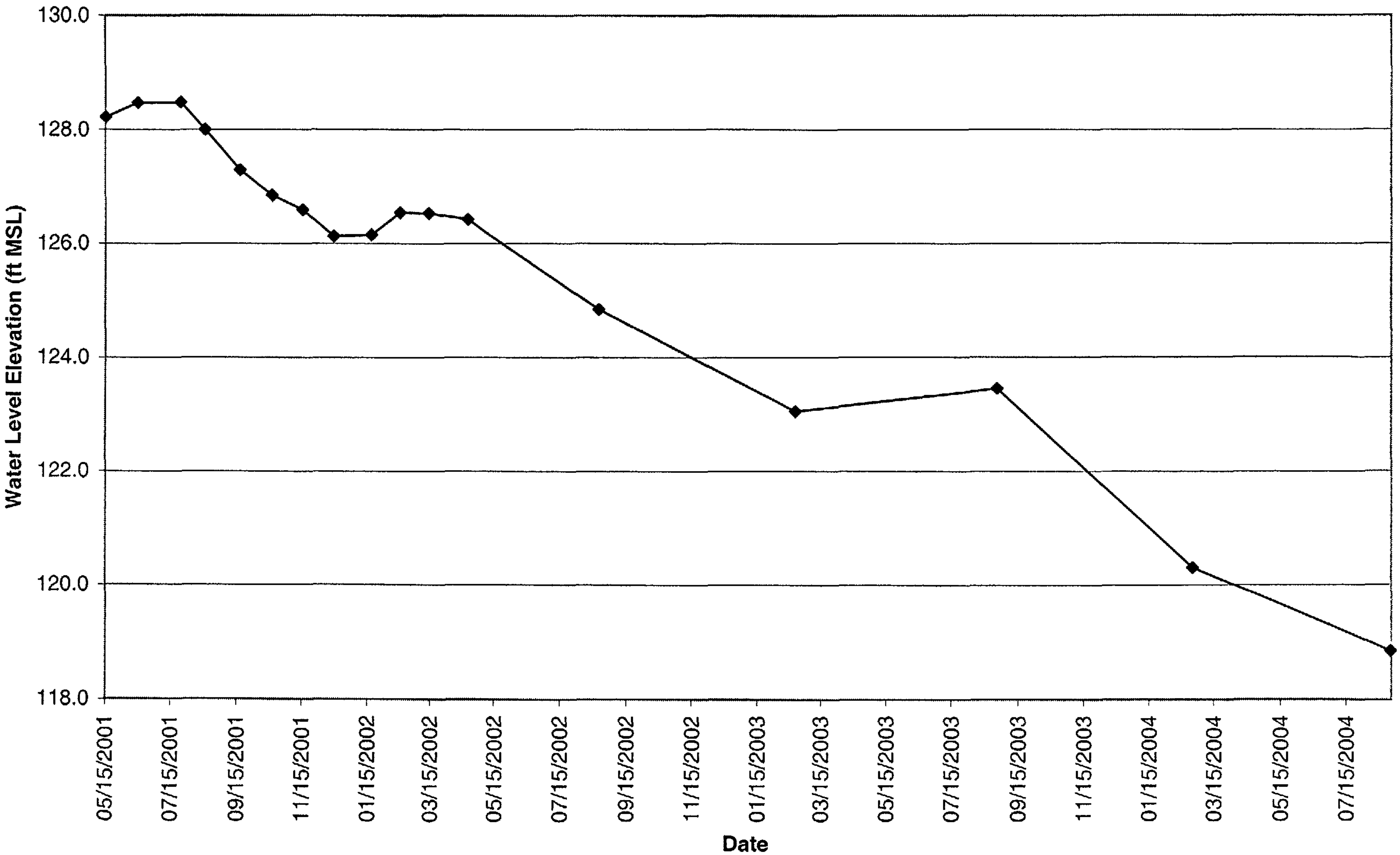
P:\10500\Reports\Phase1a Rept Addendum\Revised 2004\AppG-HGraphs_T-SPlots\App_G_Hydrographs.xls

Figure G-7, OW-5 Hydrograph 5/15/2001-8/25/2004



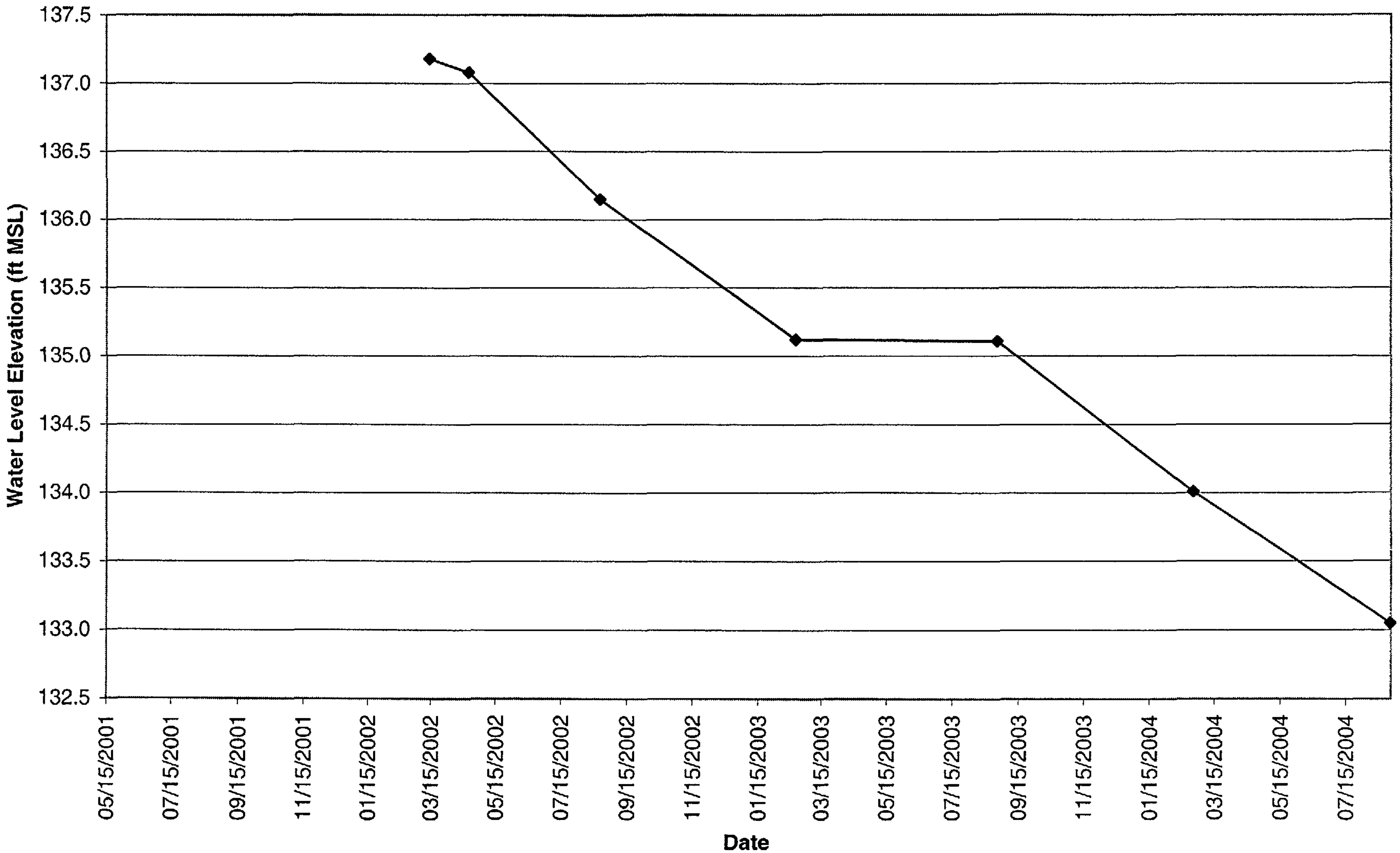
P:\10500\Reports\Phase1a Rept Addendum\Revised 2004\AppG-HGraphs_T-SPlots\App_G_Hydrographs.xls

Figure G-8, OW-6 Hydrograph 5/15/2001-8/25/2004



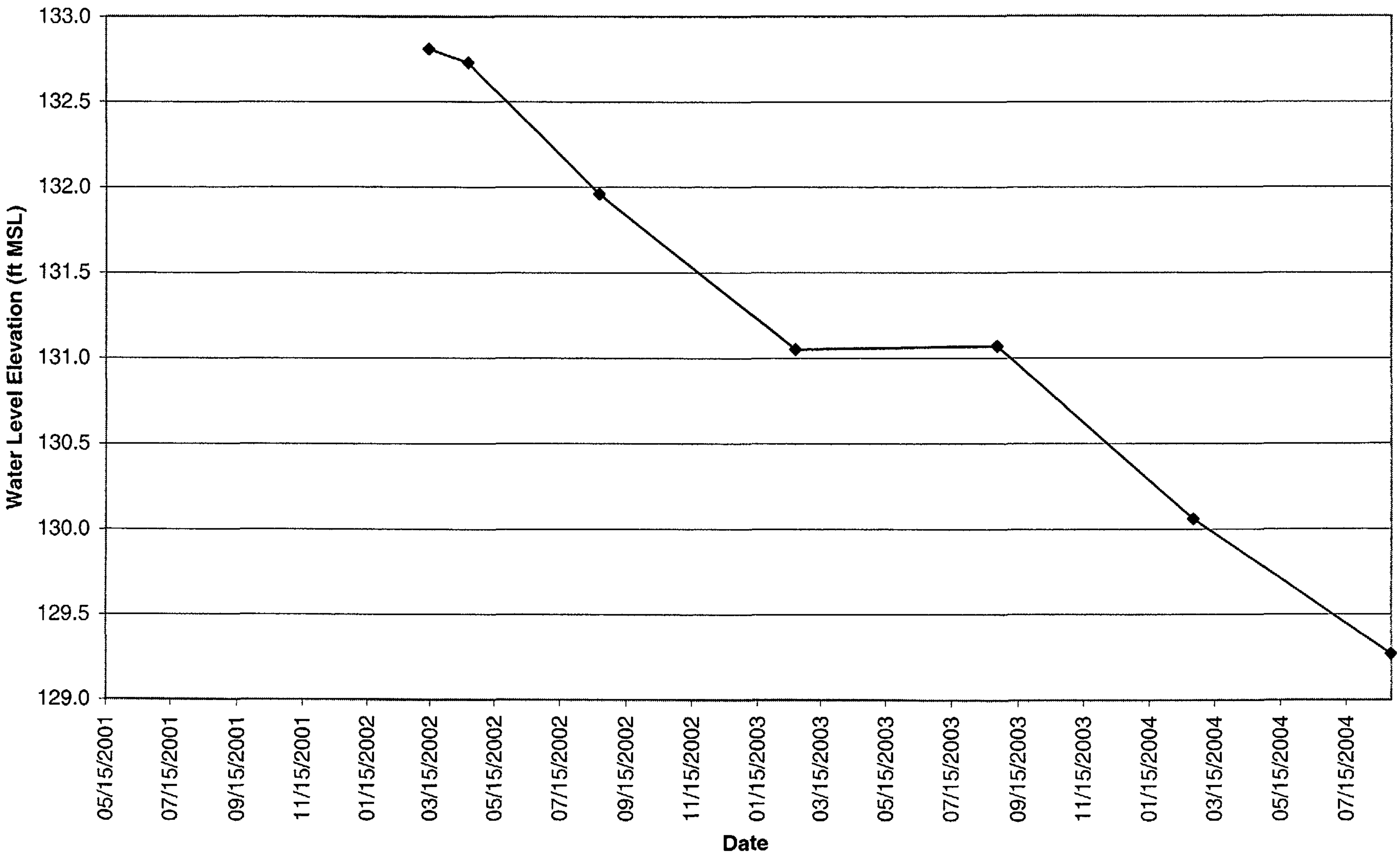
P:\10500\Reports\Phase1a Rept Addendum\Revised 2004\AppG-HGraphs_T-SPlots\App_G_Hydrographs.xls

Figure G-9, OW-7 Hydrograph 5/15/2001-8/25/2004



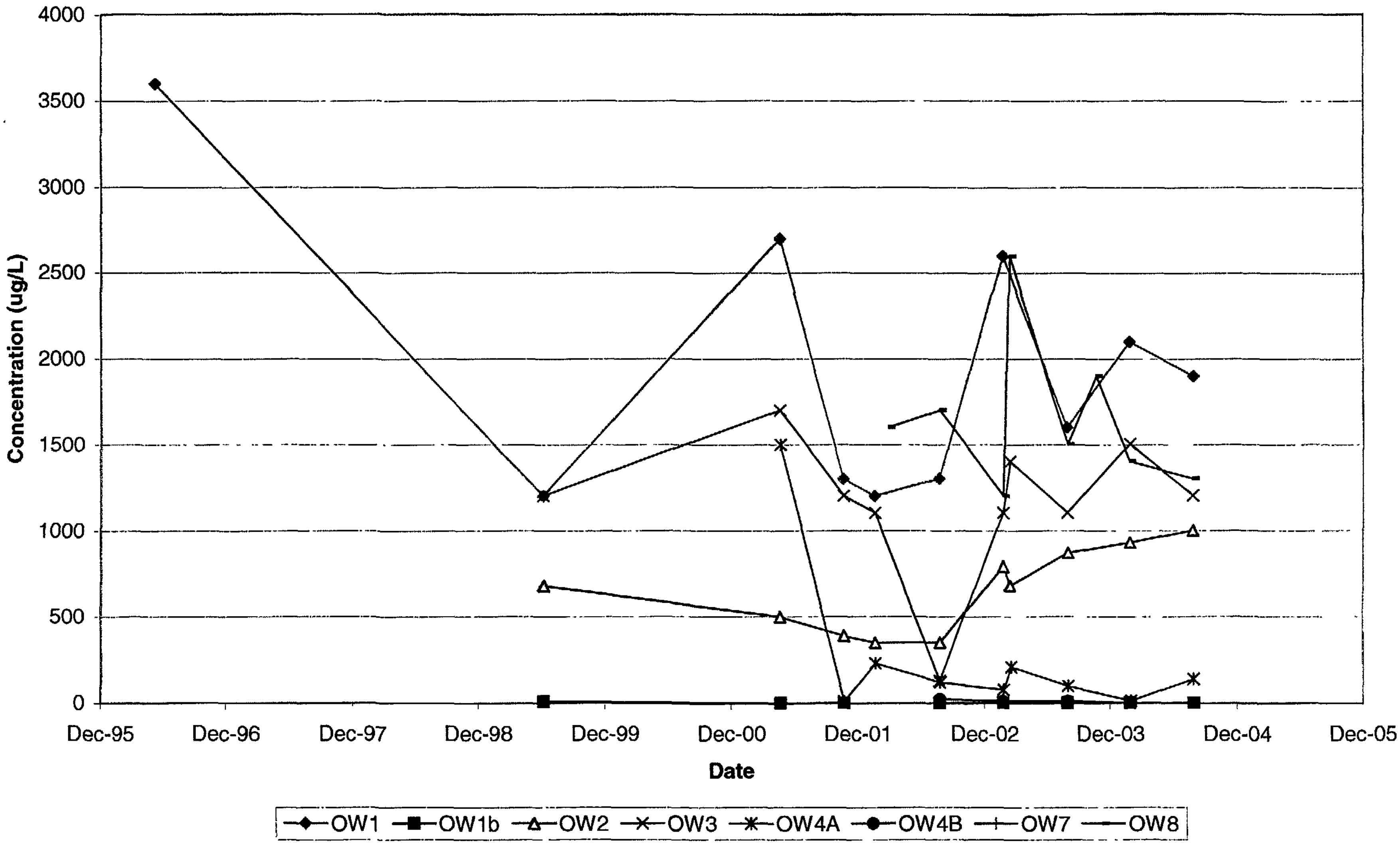
P:\10500\Reports\Phase1a Rept Addendum\Revised 2004\AppG-HGraphs_T-SPlots\App_G_Hydrographs.xls

Figure G-10, OW-8 Hydrograph 5/15/2001-8/25/2004



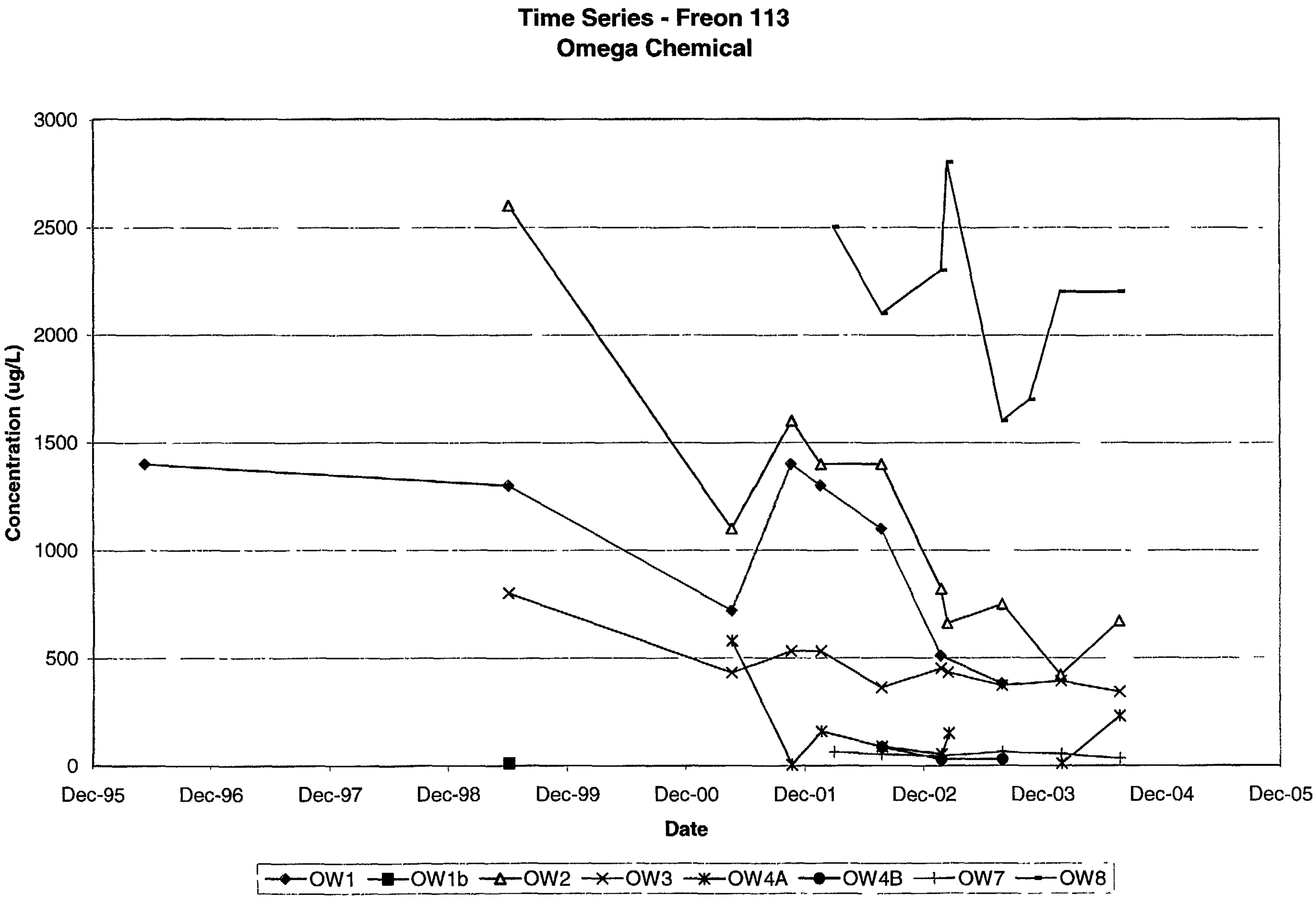
P:\10500\Reports\Phase1a Rept Addendum\Revised 2004\AppG-HGraphs_T-SPlots\App_G_Hydrographs.xls

Time Series - 1,1-Dichloroethene (1,1-DCE)
Omega Chemical



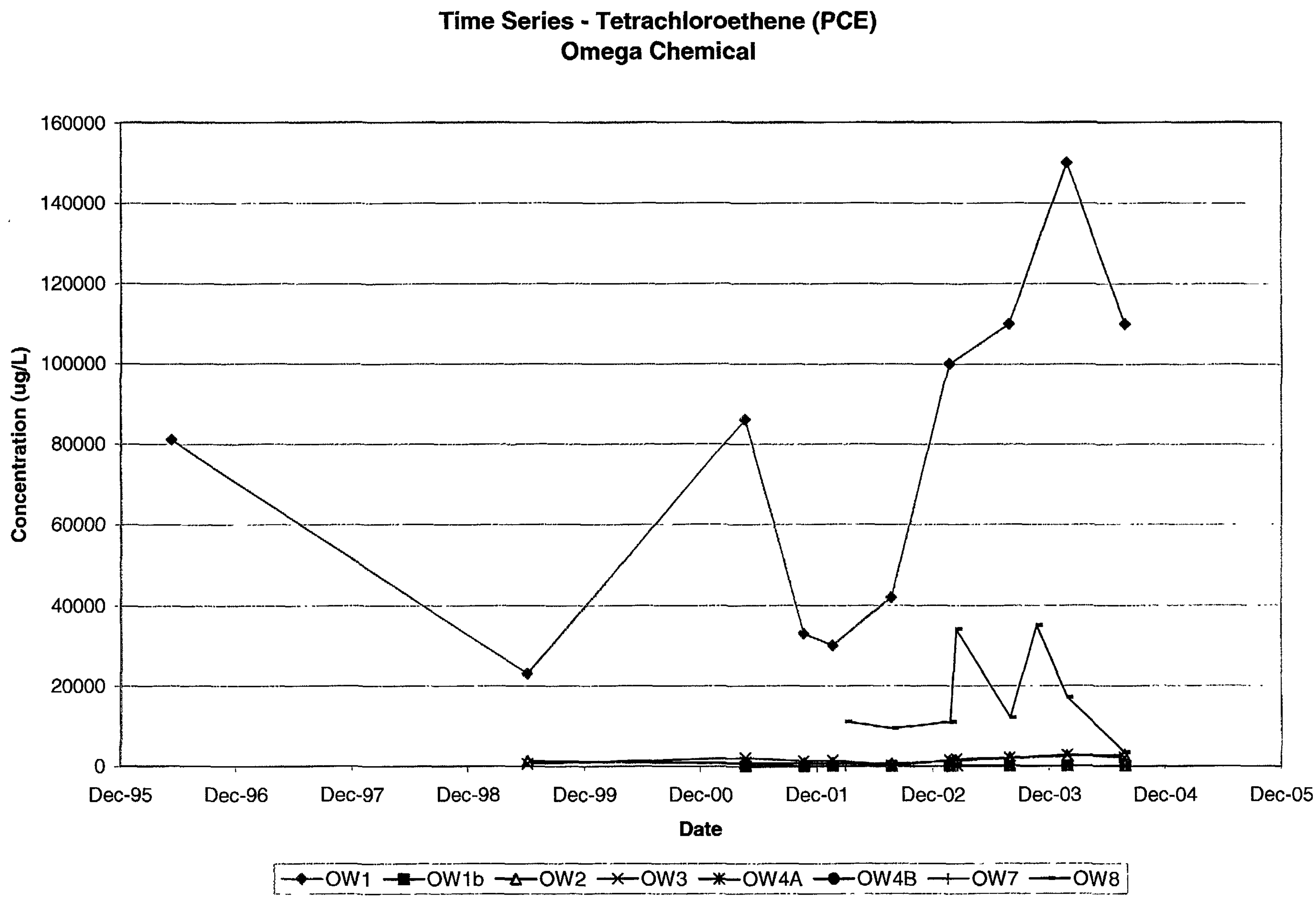
CDM

P:\10500\database\AppG_time series plot_rev.xls\11e chart



CDM

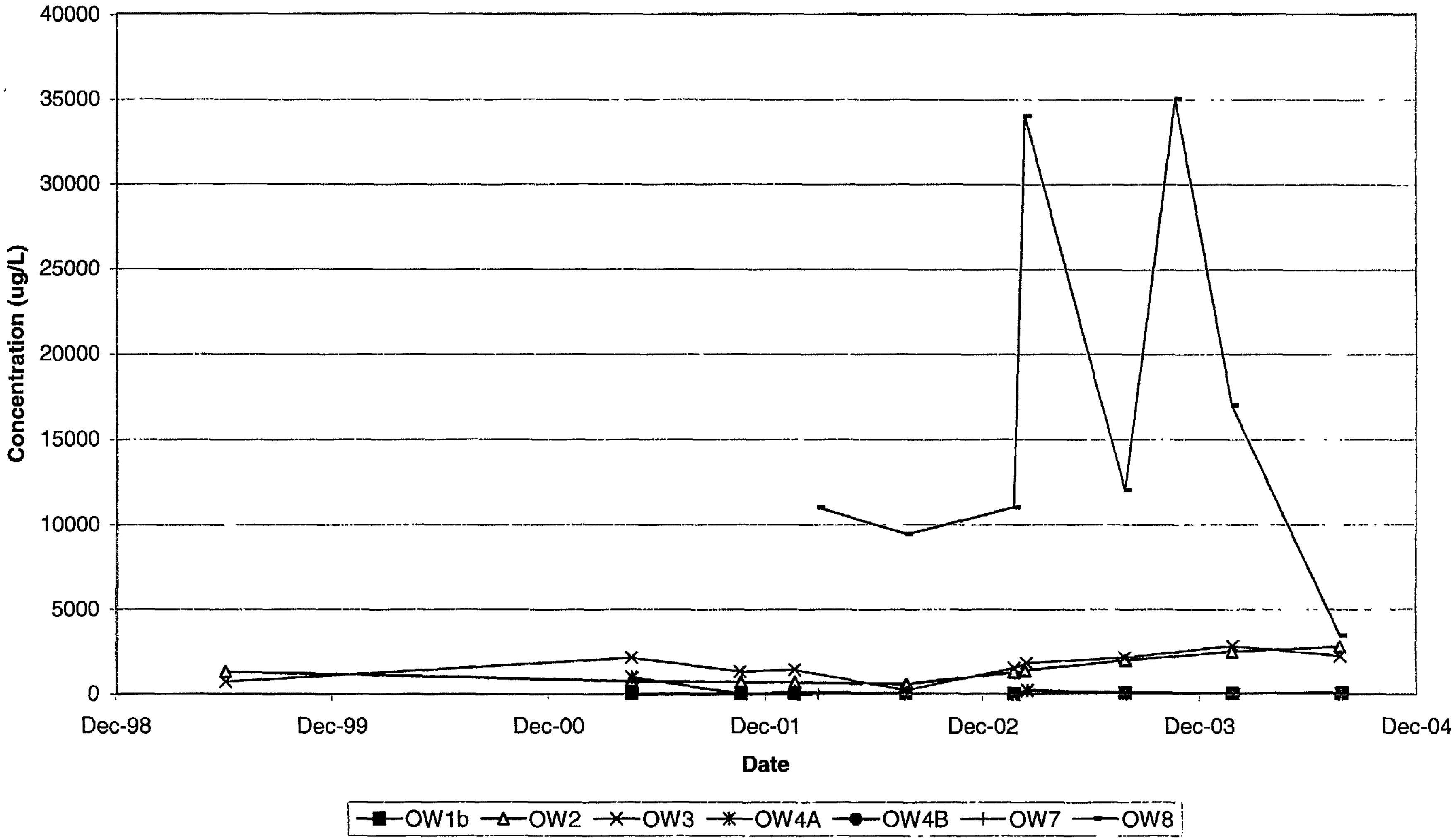
P \10500\database\AppG_time series plot_rev xls\freon 113 chart



CDM

P:\10500\database\AppG_time series plot_rev.xls\pce chart

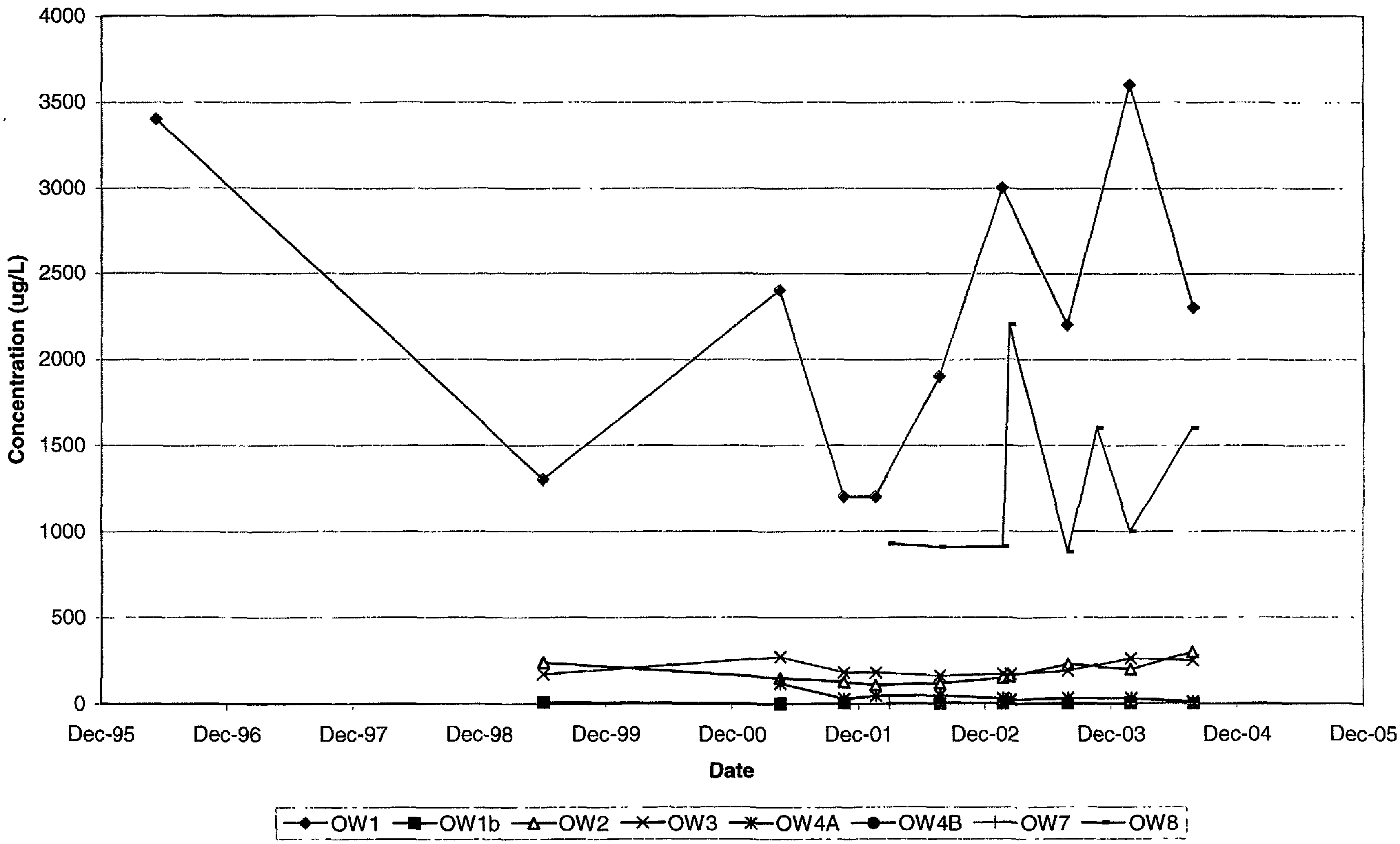
Time Series - Tetrachloroethene (PCE)
Without OW-1
Omega Chemical



CDM

P:\10500\database\AppG_time series plot_rev.xls\pce chart (2)

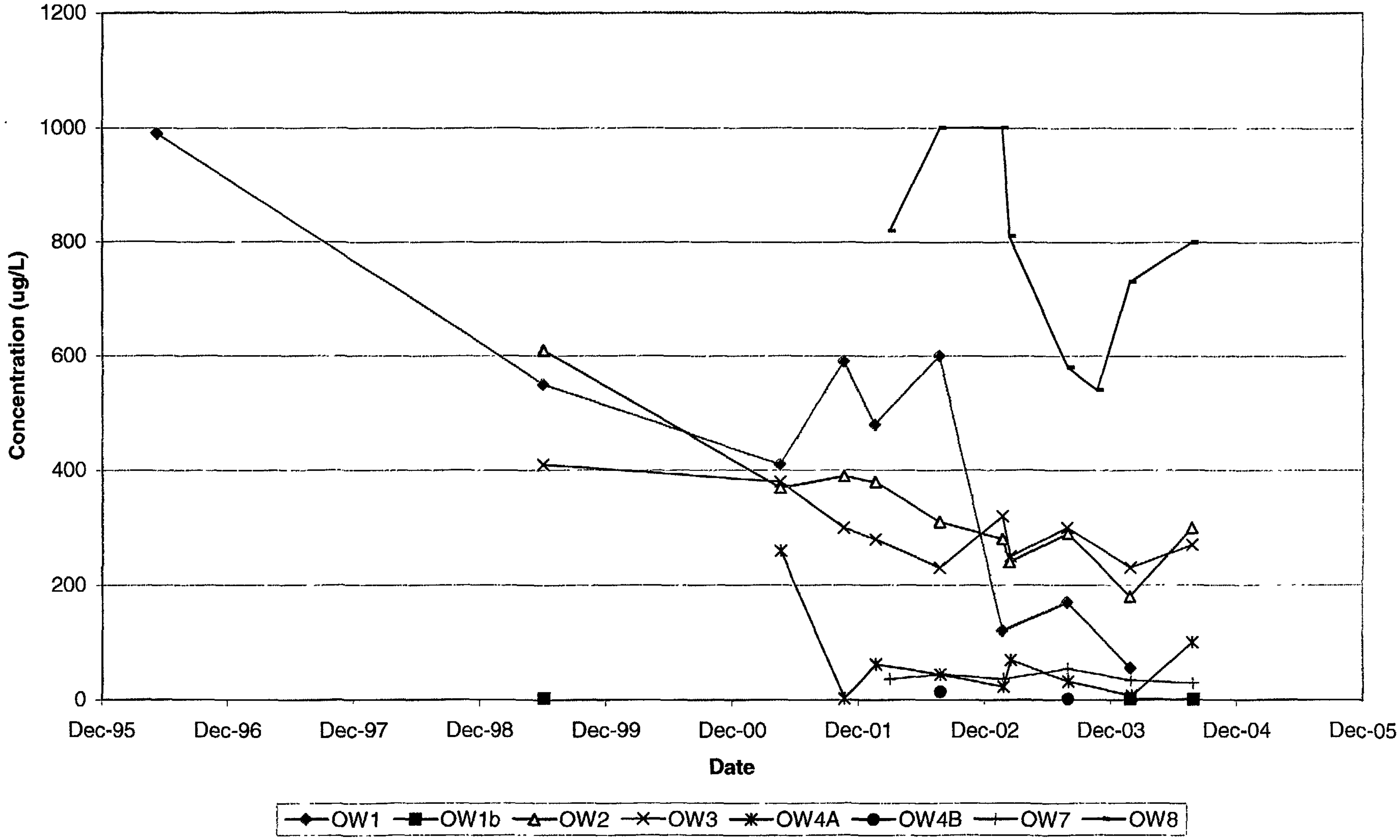
Time Series - Trichloroethene (TCE)
Omega Chemical



CDM

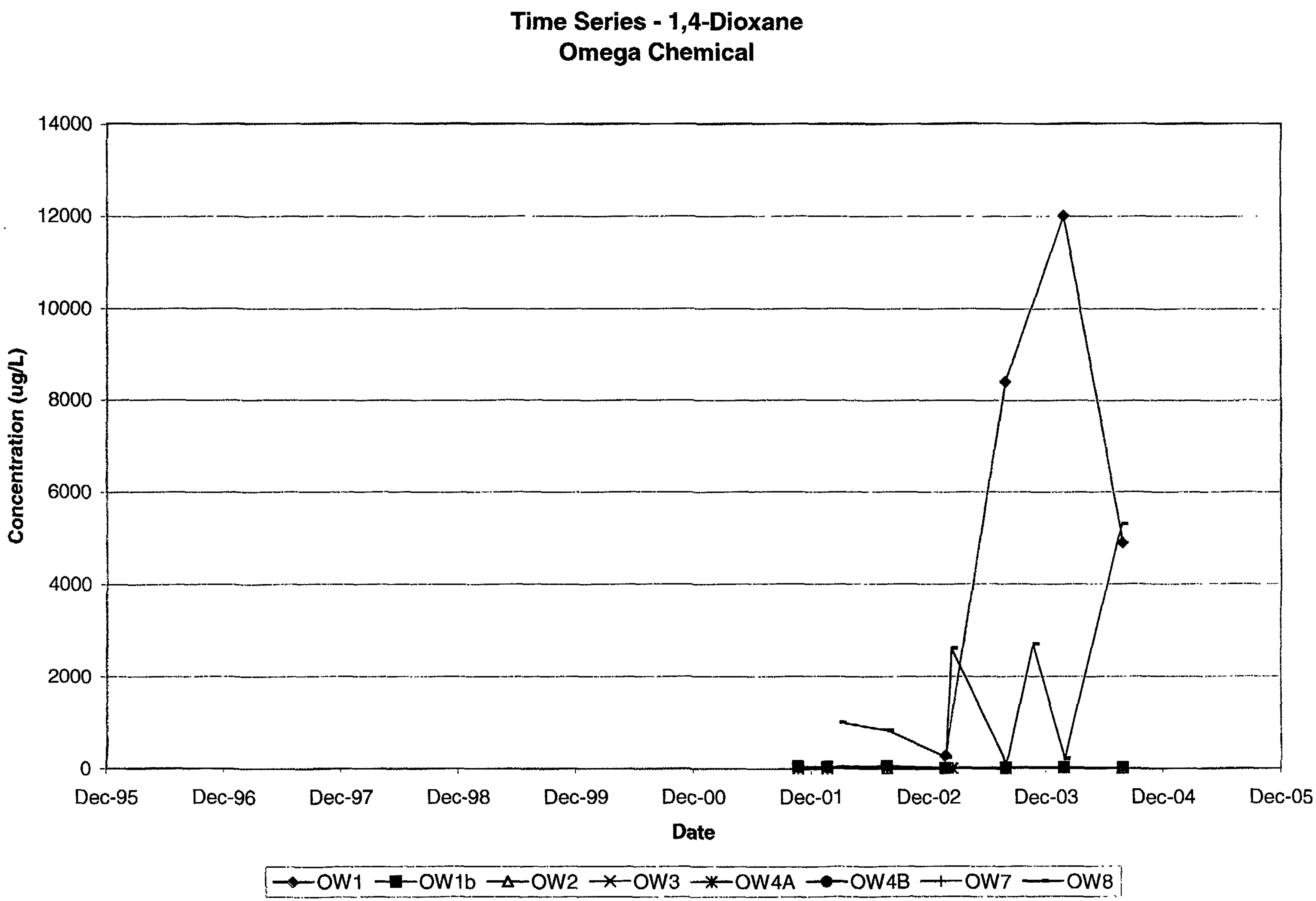
P:\10500\database\AppG_time series plot_rev.xls\tce chart

Time Series - Freon 111 Trichlorofluoromethane
Omega Chemical



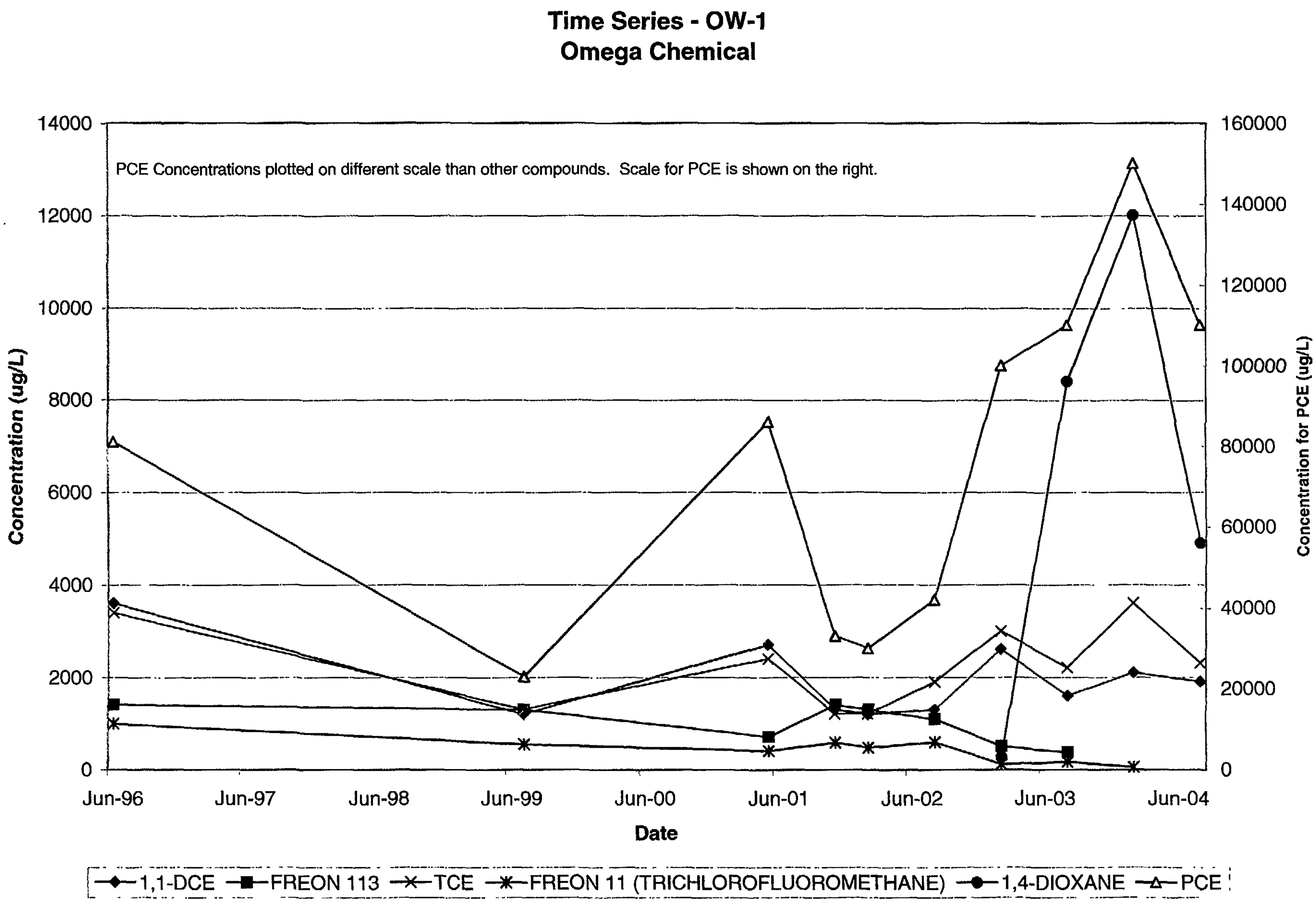
CDM

P:\10500\database\AppG_time series plot_rev.xls\tfm chart



CDM

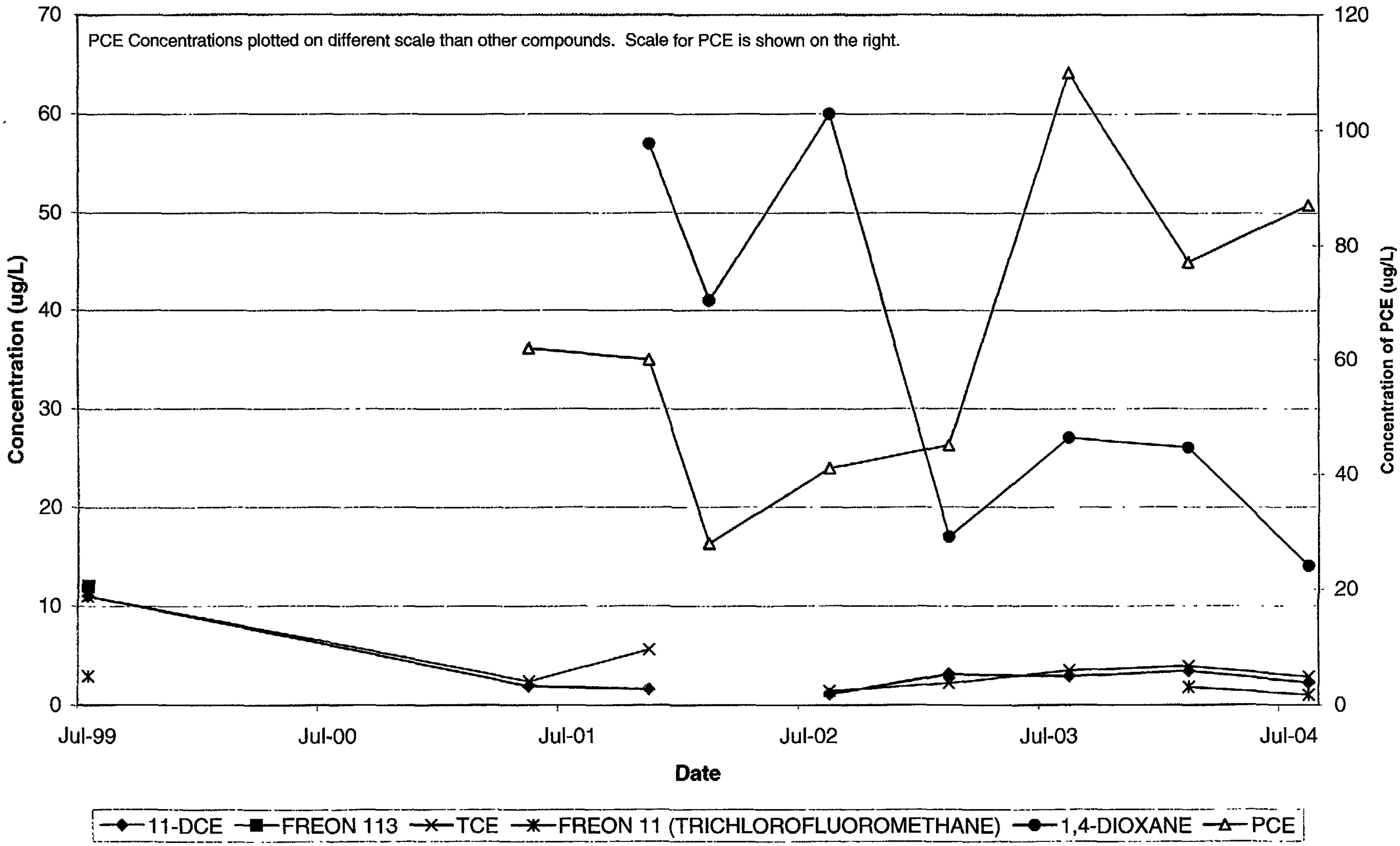
P:\10500\database\AppG_time series plot_rev.xls\14a chart



CDM

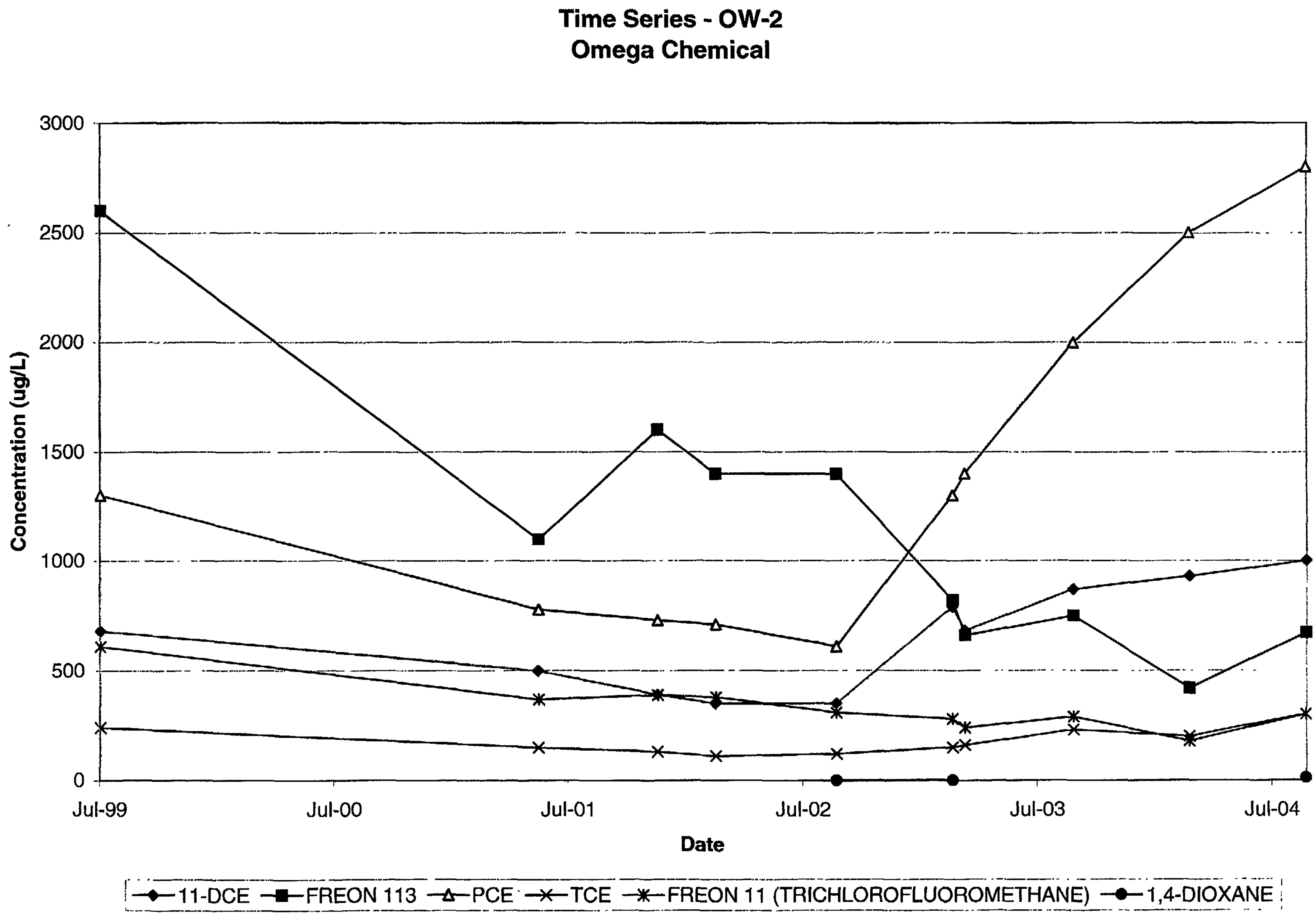
P:\10500\database\AppG_time series plot_rev.xls\ow1

Time Series - OW-1B
Omega Chemical



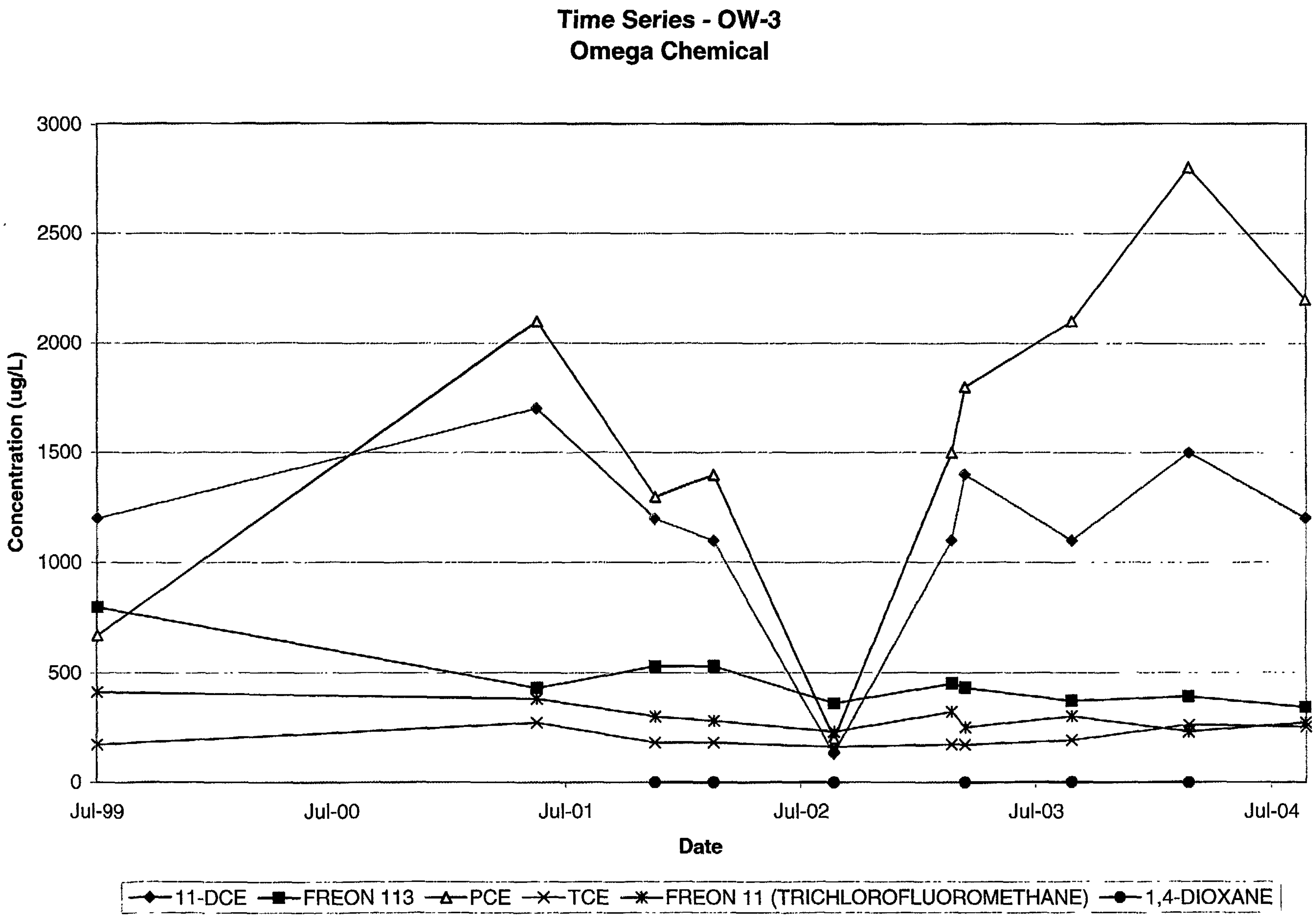
CDM

P:\10500\database\AppG_time series plot_rev.xls\ow1b chart

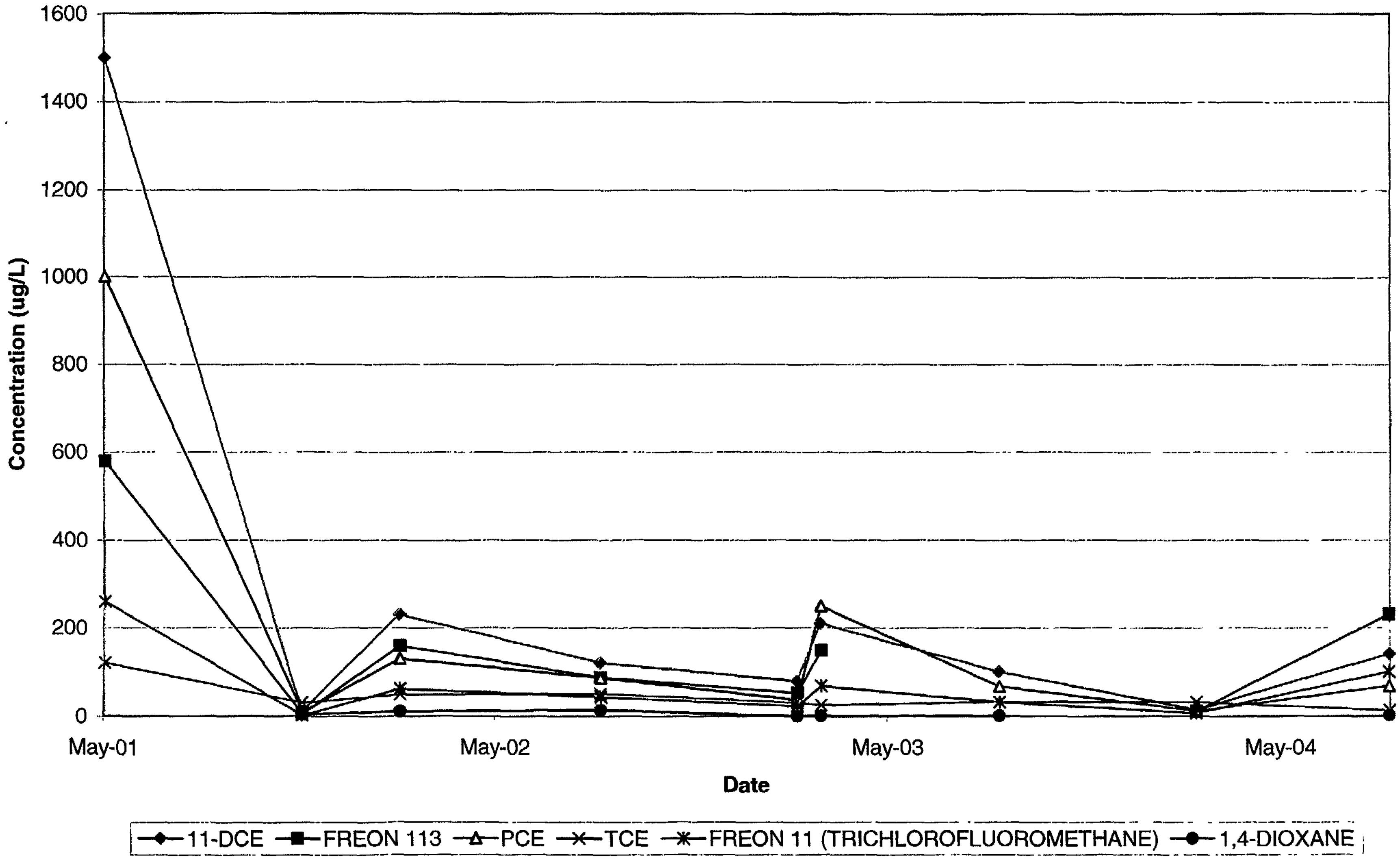


CDM

P:\10500\database\AppG_time series plot_rev.xls\OW2

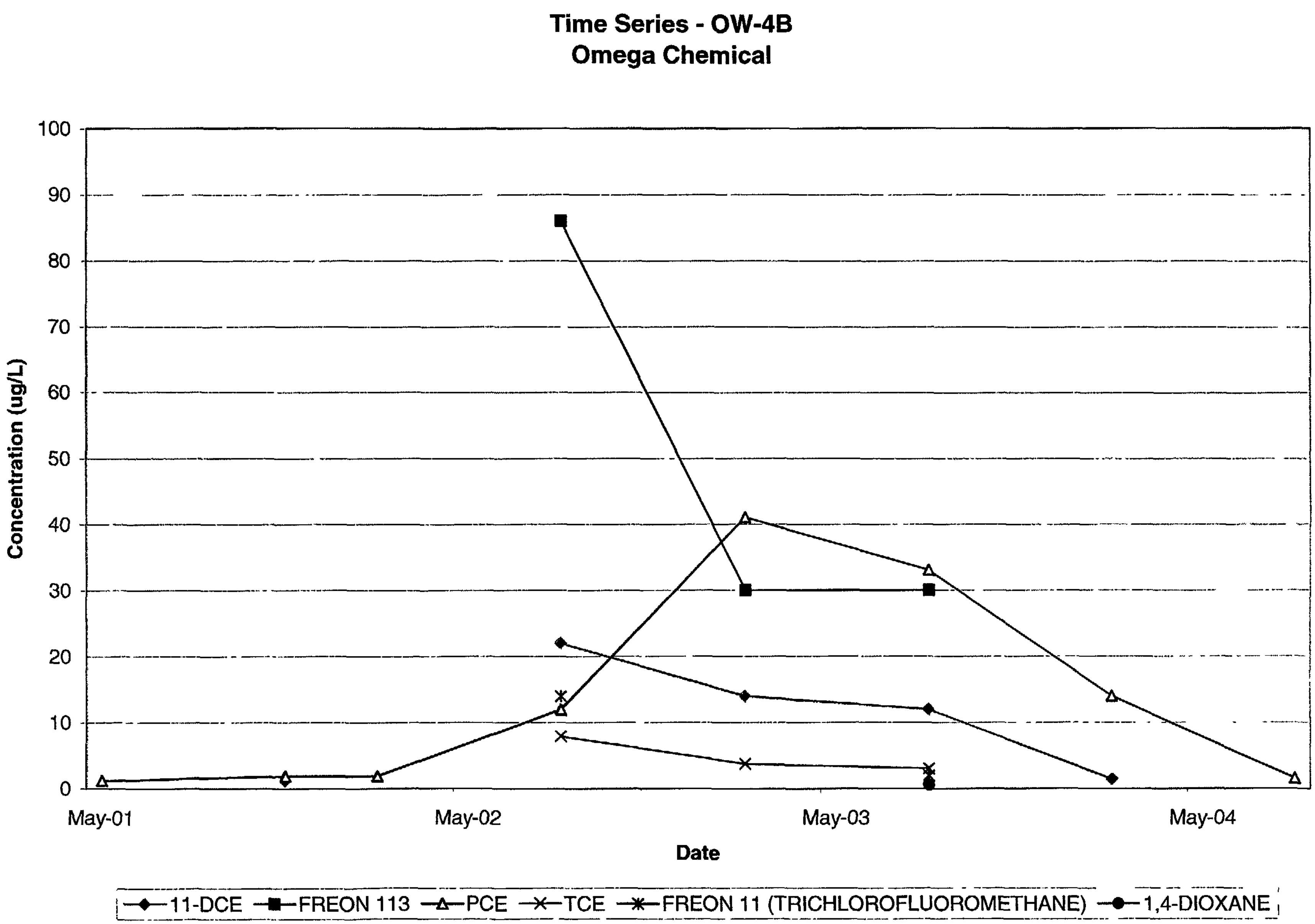

Time Series - OW-3
Omega Chemical
Concentration (ug/L)
3000
2500
2000
1500
1000
500
0
Jul-99
Jul-00
Jul-01
Jul-02
Jul-03
Jul-04
Date
11-DCE
FREON 113
PCE
TCE
FREON 11 (TRICHLOROFLUOROMETHANE)
1,4-DIOXANE

Time Series - OW-4A
Omega Chemical



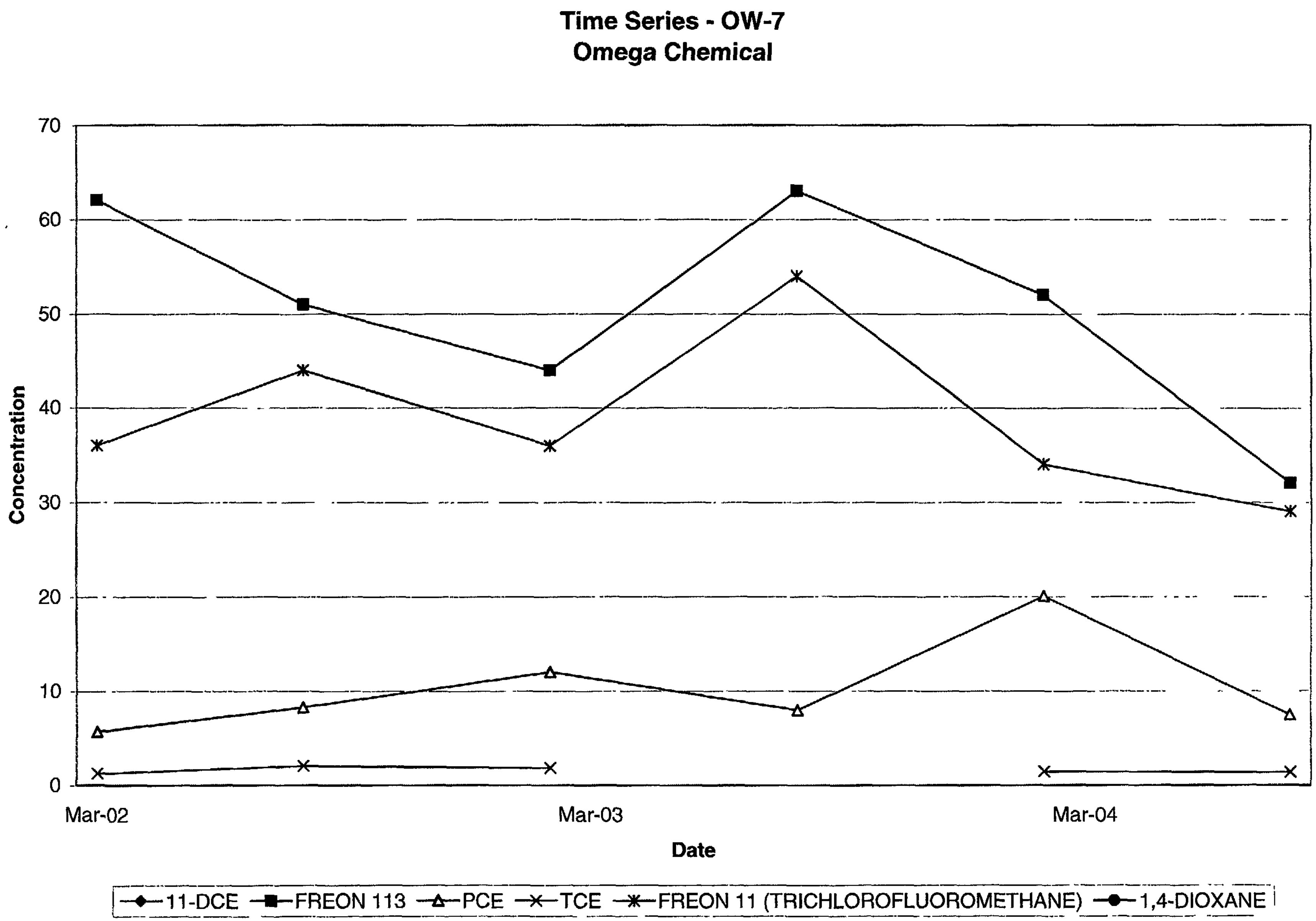
CDM

P:\10500\database\AppG_time series plot_rev.xls\ow4a



CDM

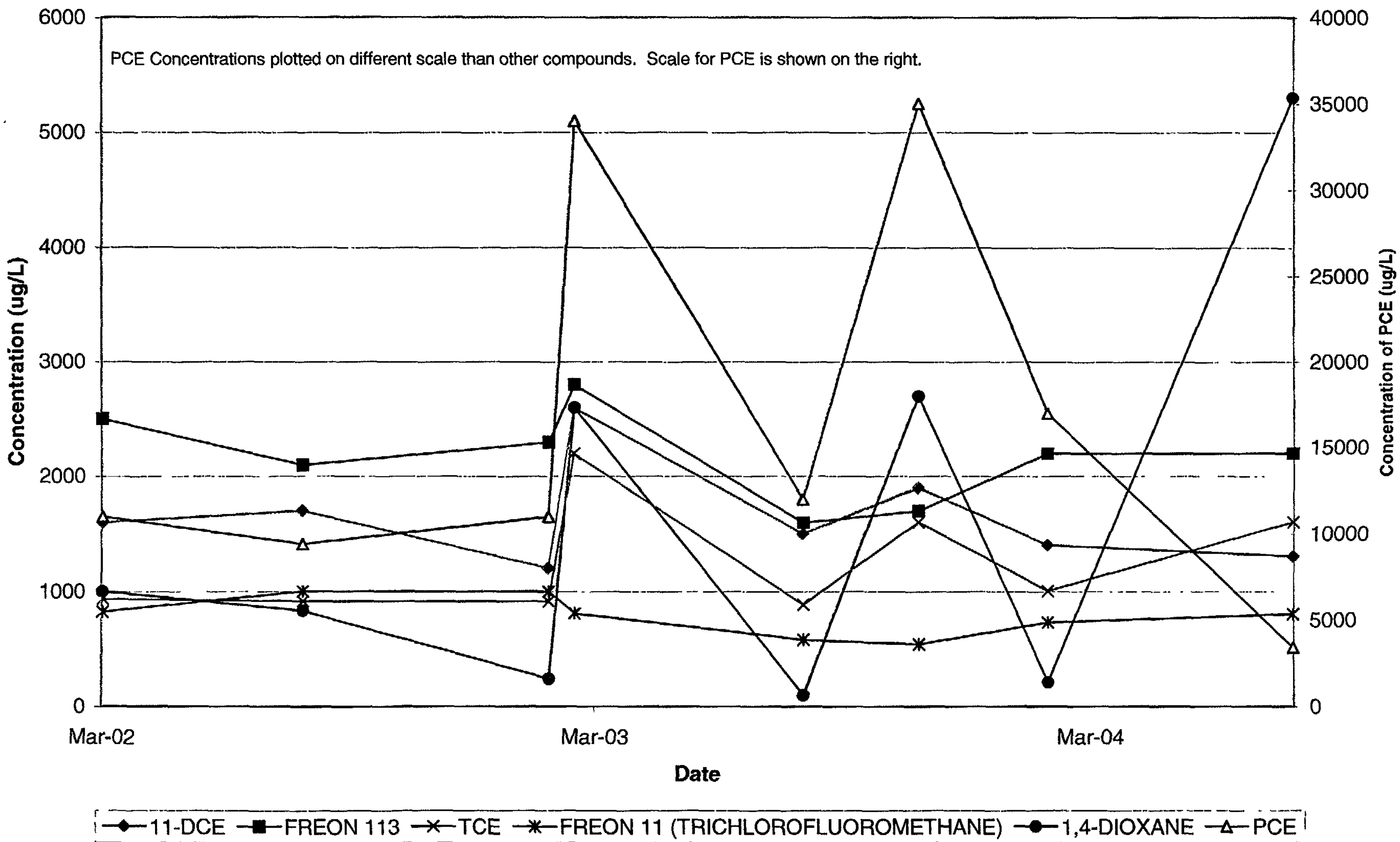
P:\10500\database\AppG_time series plot_rev.xls\OW-4b



CDM

P:\10500\database\AppG_time series plot_rev.xls\ow7

Time Series - OW-8
Omega Chemical



CDM

P:\10500\database\AppG_time series plot_rev.xls\ow8

Appendix H
Data Validation Results

Table H-1

Omega Chemical Superfund Site

Sample Review Matrix

Well Identification	Sample Date	Sample Type	Laboratory Identification	Sample Delivery Group	Analyses Requested									
					VOCs	SVOCs	1,4-Dioxane	Pesticides	Anions	Perchlorate	Cyanide	DOC	Metals	Hexavalent Chromium
OW-02	15-May-01	ORIG	DMA	IKE0589	●									
OW-01	16-May-01	N	DMA	IKE0589	●									
OW-01	16-May-01	ORIG	DMA	IKE0589	●	●		●		●	●		●	
OW-01B	16-May-01	DUP	DMA	IKE0589	●	●		●		●	●		●	
OW-01B	16-May-01	ORIG	DMA	IKE0589	●	●		●		●	●		●	
OW-03	16-May-01	ORIG	DMA	IKE0589	●									
OW-04A	16-May-01	ORIG	DMA	IKE0589	●									
OW-04B	16-May-01	ORIG	DMA	IKE0589	●									
OW-06	16-May-01	ORIG	DMA	IKE0589	●									
OW-04A	16-Aug-01	ORIG	DMA	IKH0696	○									
OW-04B	16-Aug-01	ORIG	DMA	IKH0696	○									
OW-01B	17-Aug-01	ORIG	DMA	IKH0696	○	○		○		○	○		○	
OW-02	17-Aug-01	ORIG	DMA	IKH0696	○									
OW-01	17-Aug-01	ORIG	DMA	IKH0697	○	○		○		○	○		○	
OW-03	17-Aug-01	ORIG	DMA	IKH0697	○									
OW-05	17-Aug-01	DUP	DMA	IKH0697	○									
OW-05	17-Aug-01	N	DMA	IKH0697	○									
OW-05	17-Aug-01	ORIG	DMA	IKH0697	○									
OW-06	17-Aug-01	ORIG	DMA	IKH0697	○									
OW-01	15-Nov-01	ORIG	DMA	IKK0755	○	○	○	○		○	○		○	
OW-03	15-Nov-01	ORIG	DMA	IKK0755	○		○							
OW-01B	16-Nov-01	ORIG	DMA	IKK0810	●	●	●	●		●	●		●	
OW-02	16-Nov-01	ORIG	DMA	IKK0810	●		●							
OW-04A	16-Nov-01	N	DMA	IKK0810	●									
OW-04A	16-Nov-01	ORIG	DMA	IKK0810	●		●							
OW-04B	16-Nov-01	ORIG	DMA	IKK0810	●		●							
OW-05	16-Nov-01	DUP	DMA	IKK0810	●		●							
OW-05	16-Nov-01	ORIG	DMA	IKK0810	●		●							
OW-06	16-Nov-01	ORIG	DMA	IKK0810	●		●							
OW-01	14-Feb-02	ORIG	DMA	ILB0618	●	●	○	●		●	●		●	
OW-01B	14-Feb-02	ORIG	DMA	ILB0618	●	●	○			●	●		●	
OW-02	15-Feb-02	ORIG	DMA	ILB0692	○		○							
OW-03	15-Feb-02	ORIG	DMA	ILB0692	○		○							
OW-04A	15-Feb-02	N	DMA	ILB0692	○									
OW-04A	15-Feb-02	ORIG	DMA	ILB0692	○		○							
OW-04B	15-Feb-02	ORIG	DMA	ILB0692	○		○							
OW-05	15-Feb-02	DUP	DMA	ILB0692	○		○							
OW-05	15-Feb-02	ORIG	DMA	ILB0692	○		○							
OW-06	15-Feb-02	ORIG	DMA	ILB0692	○		○							
OW-07	27-Mar-02	N	DMA	ILC1295	○									
OW-07	27-Mar-02	ORIG	DMA	ILC1295	○		○							
OW-08	27-Mar-02	ORIG	DMA	ILC1295	○		○							
OW-01	20-Aug-02	N	DMA	ILH0947	○		○							
OW-01	20-Aug-02	ORIG	DMA	ILH0947	○		○							
OW-01B	20-Aug-02	ORIG	DMA	ILH0947	○		○							
OW-03	20-Aug-02	ORIG	DMA	ILH0947	○		○							
OW-02	21-Aug-02	ORIG	DMA	ILH0947	○		○							
OW-04A	21-Aug-02	ORIG	DMA	ILH0947	○		○							
OW-06	21-Aug-02	ORIG	DMA	ILH0947	○									

Table H-1
Omega Chemical Superfund Site
Sample Review Matrix

Well Identification	Sample Date	Sample Type	Laboratory Identification	Sample Delivery Group	Analyses Requested: VOCs	SVOCs	1,4-Dioxane	Pesticides	Anions	Perchlorate	Cyanide	DOC	Metals	Hexavalent Chromium
OW-07	21-Aug-02	ORIG	DMA	ILH0947	○									
OW-04B	21-Aug-02	ORIG	DMA	ILH1043	●		○							
OW-05	22-Aug-02	ORIG	DMA	ILH1043	●									
OW-08	22-Aug-02	DUP	DMA	ILH1043	●		●							
OW-08	22-Aug-02	ORIG	DMA	ILH1043	●		●							
OW-01	19-Feb-03	ORIG	DMA	IMB1120	●		●		●	●		●		●
OW-01B	19-Feb-03	ORIG	DMA	IMB1120	●		●		●	●		●		●
OW-02	19-Feb-03	ORIG	DMA	IMB1120	●		●		●	●		●		●
OW-03	20-Feb-03	N	DMA	IMB1192	○		○		○	○		○		○
OW-03	20-Feb-03	ORIG	DMA	IMB1192	○		○		○	○		○		○
OW-04A	20-Feb-03	ORIG	DMA	IMB1192	○		○		○	○		○		○
OW-04B	20-Feb-03	ORIG	DMA	IMB1192	○		○		○	○		○		○
OW-08	20-Feb-03	DUP	DMA	IMB1192	○		○		○	○		○		○
OW-08	20-Feb-03	ORIG	DMA	IMB1192	○		○		○	○		○		○
OW-05	21-Feb-03	ORIG	DMA	IMB1298	○									
OW-06	21-Feb-03	ORIG	DMA	IMB1298	○									
OW-07	21-Feb-03	ORIG	DMA	IMB1298	○									
OW-02	10-Mar-03	ORIG	DMA	IMC0522	○		○							
OW-08	11-Mar-03	DUP	DMA	IMC0731	○		○							
OW-08	11-Mar-03	ORIG	DMA	IMC0731	○		○							
OW-03	13-Mar-03	ORIG	DMA	IMC0731	○		○							
OW-04A	14-Mar-03	ORIG	DMA	IMC0806	○		○							
OW-01	26-Aug-03	ORIG	DMA	IMH1415	●		●							
OW-01B	26-Aug-03	ORIG	DMA	IMH1415	●		●							
OW-03	26-Aug-03	ORIG	DMA	IMH1415	●		●							
OW-07	26-Aug-03	ORIG	DMA	IMH1415	●		●							
OW-02	27-Aug-03	ORIG	DMA	IMH1521	○		○							
OW-04A	27-Aug-03	ORIG	DMA	IMH1521	○		○							
OW-04B	27-Aug-03	ORIG	DMA	IMH1521	○		○							
OW-08	27-Aug-03	DUP	DMA	IMH1521	○		○							
OW-08	27-Aug-03	N	DMA	IMH1521	○		○							
OW-08	27-Aug-03	ORIG	DMA	IMH1521	○		○							
OW-05	28-Aug-03	ORIG	DMA	IMH1608	○		○							
OW-06	28-Aug-03	ORIG	DMA	IMH1608	○		○							
OW-08	20-Nov-03	ORIG	DMA	IMK1288	○		○							
OW-01	24-Feb-04	ORIG	DMA	INB1560	○		○							
OW-01B	24-Feb-04	ORIG	DMA	INB1560	○		○							
OW-02	24-Feb-04	ORIG	DMA	INB1560	○		○							
OW-05	24-Feb-04	ORIG	DMA	INB1560	○		○							
OW-08	24-Feb-04	ORIG	DMA	INB1560	○		○							
OW-03	25-Feb-04	DUP	DMA	INB1636	●		●							
OW-03	25-Feb-04	ORIG	DMA	INB1636	●		●							
OW-06	25-Feb-04	N	DMA	INB1636	●		●							
OW-06	25-Feb-04	ORIG	DMA	INB1636	●		●							
OW-07	25-Feb-04	ORIG	DMA	INB1636	●		●							
OW-04A	27-Feb-04	ORIG	DMA	INB1838	○		○							
OW-04B	27-Feb-04	ORIG	DMA	INB1838	○		○							
OW1	27-Aug-04	DUP	DMA	INH1702	●		●							
OW1	27-Aug-04	ORIG	DMA	INH1702	●		●							

Table H-1
Omega Chemical Superfund Site
Sample Review Matrix

Well Identification	Sample Date	Sample Type	Laboratory Identification	Sample Delivery Group	VOCs	SVOCs	1,4-Dioxane	Pesticides	Anions	Perchlorate	Cyanide	DOC	Metals	Hexavalent Chromium
					Analyses Requested									
OW1b	27-Aug-04	ORIG	DMA	INH1702	●		●							
OW2	24-Aug-04	ORIG	DMA	INH1390	❍		❍							
OW3	24-Aug-04	ORIG	DMA	INH1390	❍		❍							
OW4A	25-Aug-04	DUP	DMA	INH1465	❍		❍							
OW4A	25-Aug-04	ORIG	DMA	INH1465	❍		❍							
OW4B	25-Aug-04	ORIG	DMA	INH1465	❍		❍							
OW5	25-Aug-04	ORIG	DMA	INH1465	❍		❍							
OW6	25-Aug-04	ORIG	DMA	INH1465	❍		❍							
OW7	25-Aug-04	ORIG	DMA	INH1465	❍		❍							
OW8	24-Aug-04	N	DMA	INH1390	❍		❍							
OW8	24-Aug-04	ORIG	DMA	INH1390	❍		❍							
OW8B	24-Aug-04	ORIG	DMA	INH1390	❍		❍							
				Total number of samples collected	110	9	82	8	9	18	9	9	9	9
				Number of samples validated	38	6	24	5	3	9	6	3	6	3
				% Validated	35	67	29	63	33	50	67	33	67	33

❍ Sample result evaluated (but not validated) for QC compliance
● Sample result validated
ORIG *Original groundwater sample*
DUP Duplicate (split) groundwater sample
N Equipment decontamination blank

DATA VALIDATION REPORT
CLP-LIKE DATA PACKAGE

Project: Omega Chemical Superfund Site
Groundwater Monitoring Well Sampling – August 2004

References: USEPA CLP National Functional Guidelines for Organic Data Review October 1999 (EPA540/R-99/008)

SW-846 Method 8000B, December 1996
SW-846 Method 8260B, December 1996
SW-846 Method 8270C, December 1996

Reviewer: Barbara Wells
CDM - Carlsbad, California

Date: December 2004

Analytical Laboratory: Del Mar Analytical (Del Mar)
Irvine, California 92614

DATA REVIEW

Three water samples (listed below) were collected on August 27, 2004, and transported to Del Mar Analytical. All samples were collected from groundwater monitoring wells and were analyzed for the following: volatile organic compounds (VOCs) by EPA Method 8260B and 1,4-dioxane by EPA Method 8270 (modified). Sample identification and collection dates are summarized in the following table.

Sample Summary Table

Sample ID	*Lab Sample ID*	*Sample Type* [1]	*Date Collected*
OC-GW-OW1b-082704	INH1702-01	GW	8/27/04
OC-GW-OW1-082704	INH1702-02	GW	8/27/04
OC-GW-OW1k-082704	INH1702-03	K	8/27/04

Notes:
[1] GW = Groundwater sample
K = Split (duplicate) groundwater sample

VOLATILE ORGANIC COMPOUNDS ASSESSMENT - METHOD 8260B

I. TECHNICAL HOLDING TIMES

All technical holding times requirements were met. Water samples were analyzed between September 8 and 10, 2004, which is within the 14-day holding time criteria.

II. INITIAL CALIBRATION

Initial calibration of the instrument must be performed using a minimum of five standard concentrations. For initial calibration to be accepted, five system performance check compounds (SPCCs) must meet the following minimum average response factors (RFs):

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

SPCCs are used to check compound instability and to check for degradation caused by contaminated lines or active sites in the system. The average RF for each of the five SPCCs met the minimum calibration criteria listed above.

Additionally, the relative standard deviation (RSD) of the response factors of the initial calibration curve should be less than or equal to 15 percent for all target analytes and less than or equal to 30 percent for six calibration check compounds (CCCs). The six CCCs are: 1,1-dichloroethene, chloroform, 1,2-dichloropropane, toluene, ethylbenzene and vinyl chloride. If the RSD of the target analytes is 15 percent or less and less than 30 percent for the six CCCs, then the RF is assumed to be constant over the calibration range and the average RF can be used for quantitation.

If the RSD of the target analytes exceeds the 15 percent criterion, other calibration options can be employed. As discussed in Section 7.0 of Method 8000, linear calibration using a least squares regression may be used with the initial calibration data to demonstrate the instrument calibration linearity. Least squares regression was used for the target analytes listed above, which did not have an average RF of 15 percent or less. For initial calibration to be accepted using a least squares model, the coefficient of determination must be greater than or equal to 0.99.

Initial calibration of GC/MS #1 was performed on August 23, 2004 using a minimum of five concentrations ranging from 0.5 to 200 µg/L, which meet the method requirement of initial calibration using five concentration levels. GC/MS #1 was used to analyze all samples included in this group. All target analytes and CCCs met the 15 percent calibration criteria except for acetone, bromochloromethane, bromoform and 1,2-dibromo-3-chloropropane. The coefficient of determination exceeded 0.99 for these four compounds. All criteria for initial calibration were met for all compounds and no qualification is necessary.

Initial calibration of GC/MS #33 was performed on August 23, 2004 using a minimum of five concentrations ranging from 0.5 to 200 µg/L, which meet the method requirement of initial calibration using five concentration levels. GC/MS #33 was used to re-analyze sample OW1 at a dilution factor of 400x on September 10, 2004. All target analytes and CCCs met the 15 percent calibration criteria for GC/MS #33 except for bromoform, 1,2-dibromo-3-chloropropane, 1,1,2,2-tetrachloroethane and 2-chloroethyl vinyl ether. The coefficient of determination exceeded 0.99 for these four compounds. All criteria for initial calibration of GC/MS #33 were met for all compounds and no qualification is necessary.

Initial calibration of GC/MS #13 was performed on August 25, 2004 using a minimum of five concentrations ranging from 0.5 to 200 µg/L, which meet the method requirement of initial calibration using five concentration levels. GC/MS #13 was used to re-analyze sample OW1K on September 9 and 10, 2004 at dilution factors of 100 and 2500, respectively. All target analytes and CCCs met the 15 percent calibration criteria for GC/MS #13 except for bromoform, 2-chloroethyl vinyl ether, 1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane and naphthalene. The coefficient of determination exceeded 0.99 for these compounds. All criteria for initial calibration of GC/MS #13 were met for all compounds and no qualification is necessary.

III. CONTINUING CALIBRATION

The initial GC/MS calibration is verified once every 12 hours by analyzing a 4-bromofluorobenzene tuning standard and a calibration verification standard (a midpoint check standard) and prior to analyzing any samples. The calibration verification standard must contain each of the five SPCCs used during initial calibration. The minimum RF for each SPCC must meet the criteria specified for initial calibration (i.e., 0.10 to 0.30). In addition, initial calibration is checked using the CCCs used during initial calibration. If the percent difference (%D) of each of the CCCs is less than 20 percent, the initial calibration is assumed to be valid.

Samples were analyzed on September 8, 2004 (GC/MS #1), 9 (GC/MS #13) and 10 (GC/MS #33), 2004. Prior to sample analysis, a 50 ng BFB tuning standard was analyzed. Mass ion abundance criteria were met for the system. Each of the five SPCCs and the six CCCs were contained in a mid-point check standard at concentrations of 25 ppb. The RF for each of the SPCCs was greater than the criteria specified and the %D between the continuing calibration and the initial calibration for each of the CCCs was less than 20 percent for each batch of samples. Therefore, the initial calibrations were validated and continuing calibration criteria were met.

IV. METHOD BLANKS

A method blank must be analyzed with each batch of samples for each matrix type immediately after initial calibration is verified and before sample analysis. A total of four method blanks were reported, which correspond to the four analytical batches.

Except for methylene chloride, no target analytes were detected at concentrations above their respective reporting limits in the blanks analyzed on September 8, 9 and 10, 2004. Methylene chloride was detected in the method blank analyzed on September 8, 2004 at a concentration of 0.78 ug/l, which is below the reporting limit of 5 ug/l. Methylene chloride was also detected in sample OW1b at an estimated (i.e., below reporting limit) concentration of 1.2 ug/l. Because this concentration is less than 10 times the method blank concentration, the result was qualified with a "U" to indicate a non-detectable concentration.

V. SURROGATES

Three surrogate spikes (dibromofluoromethane, toluene-d8 and 4-bromofluorobenzene) were added to each environmental sample, QC sample, and method blank, as required by the method. Surrogate control limits were established by the laboratory and are 80 to 120 percent for all three surrogates.

All surrogate recoveries were within the acceptable control limits.

VI. MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Four MS and MSD sample sets were analyzed with this group of samples. Acceptance limits for MS and MSD recoveries and the relative percent difference (RPD) between the MS and the MSD were statistically determined by the laboratory and were provided with the laboratory report for each analyte.

Except for PCE in one batch of samples, the percent recoveries for all other MS and MSD samples were within the acceptance criteria for all spiked compounds. PCE was reported in the MS analyzed on September 8, 2004 at 64 percent, which is slightly below the lower control limit of 70 percent. Because the MSD and LCS recoveries were both within acceptable limits, qualification of the data was not warranted. Therefore, no further action was required.

The relative percent difference (RPD) between the MS and MSD samples were within acceptable criteria for all compounds in each of the analytical batches. Therefore, acceptable precision was demonstrated.

VII. LABORATORY CONTROL SAMPLES (LCS)

Four LCS samples were analyzed, which meets the analytical method requirement of one LCS per analytical batch. Results from the LCS sample were included in the analytical report. All LCS analyte recoveries were within the acceptance limits established by the laboratory, which demonstrates acceptable accuracy.

VIII. REGIONAL QUALITY ASSURANCE AND QUALITY CONTROL

Sample OW1k was submitted as a field duplicate of OW1. The RPDs between the sample and its duplicate exceeded the recommended criteria of 20 percent for three analytes (PCE, 1,1,1-TCA and TCE). Although slightly poor precision was demonstrated, it was likely the result of analyzing the two samples at different dilution factors. Both samples contained extremely high analyte concentrations. The original sample was analyzed at a dilution of 400; whereas, the duplicate sample was analyzed at a factor of 100. Because the detected analyte concentrations in both samples were generally within the same order of magnitude, the precision deficiency is not considered significant enough to qualify the results.

IX. INTERNAL STANDARDS

Internal standard (IS) area counts and retention times for samples analyzed on September 8 through 10, 2004 were within validation criteria. IS area counts for all samples analyzed were within -50 - +100 percent of the IS area count from the daily calibration standard. IS retention times were within ±30 seconds from the retention time of the associated daily standard.

X. TARGET COMPOUND IDENTIFICATION

All positive compound identifications were confirmed through the mass spectra library.

XI. COMPOUND QUANTITATION

Several positive results were recalculated to ensure that compound quantitation was accurate. No errors were encountered. Compound quantitation was based on the initial calibration average RF.

XII. SYSTEM PERFORMANCE

The system performance was acceptable.

XIII. OVERALL ASSESSMENT OF VOC DATA

All QC criteria evaluated during data validation of the VOC analyses were within acceptable limits. No QC issues were encountered that were significant enough to reject the data. One result (methylene chloride in the sample collected from well OW1B), however, was qualified as non-detectable due to method blank contamination. All other VOC data can be used as reported and meet the project objectives.

1,4-DIOXANE DATA ASSESSMENT

Three samples were analyzed for low-level 1,4-dioxane. Because there is no analytical method promulgated by EPA for the analysis of low-level 1,4-dioxane, Del Mar followed a modified EPA Method 8270C method, using isotopic dilution with GC/MS. Method 8270C QC criteria were used during this review to assess data for general compliance. Data reviewed for the 1,4-dioxane analyses include: holding times, instrument calibration, blank results, LCS recoveries, and MS/MSD recoveries and precision.

I. TECHNICAL HOLDING TIMES

According to Method 8270C, the holding time for 1,4-dioxane in water is 7 days from sample collection until extraction; and 40 days from extraction to analysis. The samples were extracted on August 31, 2004, which is four days from sample collection, and analyzed on September 1 and 15, 2004. Therefore, all holding times were met.

II. INITIAL CALIBRATION

Initial calibration of GC/MS #5 was performed on August 17, 2004, using seven standard concentrations ranging from 0.2 to 10 ug/L, which meet the 8270C requirement of initial calibration using five concentration levels. The percent relative standard deviation (%RSD) of the response factors over the entire calibration curve was 5.51 percent, which meets general criteria (specified in Method 8000) of less than 15 percent. Therefore, the calibration curve was considered linear.

III. CONTINUING CALIBRATION

The initial calibration of GC/MS #5 was verified prior to sample analysis by analyzing a 2 ug/L standard (mid point of the curve). The difference between the continuing calibration verification standard and the initial value was 8 percent on September 1 and 7.3 percent on September 15, 2004, which demonstrate that the initial calibrations were valid.

IV. METHOD BLANKS

Method blanks were analyzed with the two batches of samples to verify that the instrument is free from contamination. 1,4-Dioxane was not detected at a concentration above the reporting limit of 0.5 ug/L in the method blank. Therefore, no further action is required.

V. LABORATORY CONTROL SAMPLES (LCS)

One LCS sample was analyzed with this batch of samples, which meets Method 8270C criteria. Results from the LCS sample were included in the analytical report. The LCS recovery for 1,4-dioxane in the batch of samples was 63 percent, which is within the acceptable range of 35 to 120 percent (established by Del Mar). Therefore, acceptable accuracy was demonstrated and no further action is required.

VI. MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Due to high analyte concentrations in the source sample, MS and MSD recoveries were not reported with this batch of samples. Acceptable accuracy was demonstrated by the successful analysis of the LCS.

VII. REGIONAL QUALITY ASSURANCE AND QUALITY CONTROL

Sample OW1k was submitted as a field duplicate of OW1. The RPD between 1,4 dioxane concentrations was 19 percent, which is within the acceptable limit of 20 percent. Therefore, acceptable precision was demonstrated.

VIII. INTERNAL STANDARDS

Internal standard (IS) area counts and retention times for samples analyzed on September 1 and 15, 2004 were within validation criteria. IS area counts for all samples analyzed were within -50 - +100 percent of the IS area count from the daily calibration standard. IS retention times were within ±30 seconds from the retention time of the associated daily standard.

IX. TARGET COMPOUND IDENTIFICATION

All positive compound identifications were confirmed through the mass spectra library.

X.COMPOUND QUANTITATION

Positive results were recalculated to ensure that compound quantitation was accurate. No errors were encountered. Compound quantitation was based on the initial calibration average RF.

XI. SYSTEM PERFORMANCE

The system performance was acceptable.

XII. OVERALL ASSESSMENT OF 1,4-DIOXANE DATA

Although no EPA method exists for the analysis of low-level 1,4-dioxane, the project data were reviewed for general compliance with standard QC criteria requirements specified for organic analyses. Also, QC sample results were evaluated against laboratory specified acceptance criteria for method compliance. No significant QC issues were encountered during the data review. Therefore, the 1,4-dioxane data can be used for the project purposes without qualification.

DATA VALIDATION REPORT
CLP-LIKE DATA PACKAGE

Project: Omega Chemical Superfund Site
Groundwater Monitoring Well Sampling – February 2004

References: USEPA CLP National Functional Guidelines for Organic Data Review October 1999 (EPA540/R-99/008)

SW-846 Method 8000B, December 1996
SW-846 Method 8260B, December 1996
SW-846 Method 8270C, December 1996

Reviewer: Barbara Wells
CDM - Carlsbad, California

Date: December 2004

Analytical Laboratory: Del Mar Analytical (Del Mar)
Irvine, California 92614

DATA REVIEW

Five water samples (listed below) were collected on February 25, 2004, and transported to Del Mar Analytical. All samples were collected from groundwater monitoring wells and analyzed for the following: volatile organic compounds (VOCs) by EPA Method 8260B and 1,4-dioxane by EPA Method 8270 (modified). Sample identification and collection dates are summarized in the following table.

Sample Summary Table

Sample ID	*Lab Sample ID*	*Sample Type* [1]	*Date Collected*
OC-GW-OW3-022504	INB1636-01	GW	2/25/04
OC-GW-OW9-022504	INB1636-02	DUP	2/25/04
OC-GW-OW7-022504	INB1636-03	GW	2/25/04
OC-GW-OW6-022504	INB1636-04	GW	2/25/04
OC-GW-OW10-022504	INB1636-05	N	2/25/04

Notes:
[1] GW = Groundwater sample
DUP = Split (duplicate) groundwater sample
N = Equipment decontamination blank

VOLATILE ORGANIC COMPOUNDS ASSESSMENT - METHOD 8260B

I. TECHNICAL HOLDING TIMES

All technical holding times requirements were met. Water samples were analyzed between March 2 and 6, 2004, which is within the 14-day holding time criteria.

II. INITIAL CALIBRATION

Initial calibration of the instrument must be performed using a minimum of five standard concentrations. For initial calibration to be accepted, five system performance check compounds (SPCCs) must meet the following minimum average response factors (RFs):

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

SPCCs are used to check compound instability and to check for degradation caused by contaminated lines or active sites in the system. The average RF for each of the five SPCCs met the minimum calibration criteria listed above.

Additionally, the relative standard deviation (RSD) of the response factors of the initial calibration curve should be less than or equal to 15 percent for all target analytes and less than or equal to 30 percent for six calibration check compounds (CCCs). The six CCCs are: 1,1-dichloroethene, chloroform, 1,2-dichloropropane, toluene, ethylbenzene and vinyl chloride. If the RSD of the target analytes is 15 percent or less and less than 30 percent for the six CCCs, then the RF is assumed to be constant over the calibration range and the average RF can be used for quantitation.

If the RSD of the target analytes exceeds the 15 percent criterion, other calibration options can be employed. As discussed in Section 7.0 of Method 8000, linear calibration using a least squares regression may be used with the initial calibration data to demonstrate the instrument calibration linearity. Least squares regression was used for the target analytes listed above, which did not have an average RF of 15 percent or less. For initial calibration to be accepted using a least squares model, the coefficient of determination must be greater than or equal to 0.99.

Initial calibration of GC/MS #1 was performed on February 26, 2004 using a minimum of five concentrations ranging from 0.5 to 200 µg/L, which meet the method requirement of initial calibration using five concentration levels. GC/MS #1 was used to analyze all samples included in this group, except for the re-analysis (at a 20x dilution) of PCE in the sample collected from OW3. All target analytes and CCCs met the 15 percent calibration criteria except for acetone, dibromochloromethane, chlorobenzene, bromoform, and 1,2-dibromo-3-chloropropane. The coefficient of determination exceeded 0.99 for these five compounds. All criteria for initial calibration were met for all compounds and no qualification is necessary.

Initial calibration of GC/MS #34 was performed on February 29, 2004 using a minimum of five concentrations ranging from 0.5 to 200 µg/L, which meet the method requirement of initial calibration using five concentration levels. GC/MS #34 was used to re-analyze sample OW3 for PCE (dilution factor of 10) on March 6, 2004. All target analytes and CCCs met the 15 percent calibration criteria for GC/MS #34 except for bromoform, 1,2-dibromo-3-chloropropane, 1,2,4-trichlorobenzene, naphthalene, and 1,2,3-trichlorobenzene. The coefficient of determination exceeded 0.99 for these five compounds. All criteria for initial calibration of GC/MS #34 were met for all compounds and no qualification is necessary.

III. CONTINUING CALIBRATION

The initial GC/MS calibration is verified once every 12 hours by analyzing a 4-bromofluorobenzene tuning standard and a calibration verification standard (a midpoint check standard) and prior to analyzing any samples. The calibration verification standard must contain each of the five SPCCs used during initial calibration. The minimum RF for each SPCC must meet the criteria specified for initial calibration (i.e., 0.10 to 0.30). In addition, initial calibration is checked using the CCCs used during initial calibration. If the percent difference (%D) of each of the CCCs is less than 20 percent, the initial calibration is assumed to be valid.

Samples were analyzed on March 2, 3, 4 (GC/MS #1) and 6 (GC/MS #34), 2004. Prior to sample analysis, a 50 ng BFB tuning standard was analyzed. Mass ion abundance criteria were met for the system. Each of the five SPCCs and the six CCCs were contained in a mid-point check standard at concentrations of 25 ppb. The RF for each of the SPCCs was greater than the criteria specified and the %D between the continuing calibration and the initial calibration for each of the CCCs was less than 20 percent for each batch of samples. Therefore, the initial calibrations were validated and continuing calibration criteria were met.

IV. METHOD BLANKS

A method blank must be analyzed with each batch of samples for each matrix type immediately after initial calibration is verified and before sample analysis. A total of four method blanks were reported, which correspond to the four analysis dates. No target analytes were detected at concentrations above their respective reporting limits in the blanks analyzed on March 2, 3, 4 and 6, 2004. Therefore, all criteria were met and no further action is required.

V. SURROGATES

Three surrogate spikes (dibromofluoromethane, toluene-d8 and 4-bromofluorobenzene) were added to each environmental sample, QC sample, and method blank, as required by the method. Surrogate control limits were established by the laboratory and are 80 to 120 percent for all three surrogates.

All surrogate recoveries were within the acceptable control limits.

VI. MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Four MS and MSD sample sets were analyzed with this group of samples. Acceptance limits for MS and MSD recoveries and the relative percent difference (RPD) between the MS and the MSD were statistically determined by the laboratory and were provided with the laboratory report for each analyte.

Except for the analytes presented on the following table, the percent recoveries for the MS and MSD samples were within the acceptance criteria for all spiked compounds.

Analyte	QC Sample Type	Analysis Date	Recovery (%)	Acceptance Limits (%)
Styrene	MS	3/2/04	59	60 - 145
Carbon tetrachloride	MS	3/3/04	146	70 - 140
Bromodichloromethane	MSD	3/3/04	137	50 - 135
Carbon tetrachloride	MSD	3/3/04	145	70 - 140
1,2-Dibromoethane	MSD	3/3/04	138	70 - 125
Styrene	MSD	3/3/04	53	60 - 145
1,2-Dibromoethane	MSD	3/4/04	128	70 - 125

As shown on the preceding tabl,e all the out-of-range MS and/or MSD recoveries were above the upper control limits except for styrene. In each of these cases of elevated recoveries, the analyte was not detected in the associated project samples. Therefore, the high MS and/or MSD recoveries did not impact the results and has no affect on the usability of the data. With respect to styrene, the MS and/or MSD recoveries for the samples analyzed on March 2 and 3, 2004, were just slightly below the lower control limit of 60 percent. Because the corresponding LCS recoveries were within acceptable limits, qualification of the data was not warranted. Therefore, no further action is required.

The relative percent difference (RPD) between the MS and MSD samples were within acceptable criteria for all compounds in the four analytical batches except for 1,2-dibromo-3-chloropropane (analyzed on March 3, 2004). Because this compound was not detected in the associated samples, the slightly poor precision does not affect the project data. Therefore, qualification is not warranted.

VII. LABORATORY CONTROL SAMPLES (LCS)

Four LCS samples were analyzed with each batch of samples, which meets the analytical method requirement of one LCS per analytical batch. Results from the LCS sample were included in the analytical report. All LCS analyte recoveries were within the acceptance limits established by the laboratory, which demonstrates acceptable accuracy.

VIII. REGIONAL QUALITY ASSURANCE AND QUALITY CONTROL

Sample OC-GW-OW9-022504 was submitted as a duplicate of sample OC-GW-OW3-022504. The RPDs between detected analyte concentrations were less than 25 percent for all compounds, which demonstrates acceptable precision.

Also, sample OC-GW-OW10-022504, an equipment blank, was submitted for analysis. Tetrachloroethene (PCE) and naphthalene were detected in the field blank at concentrations of 1.4 and 1.3 ug/L, respectively. PCE concentrations detected in all associated samples were greater than 10 times the blank concentration. Therefore, the PCE concentration in the equipment blank was insignificant relative to all other sample concentrations. Naphthalene was not detected in any of the associated project samples so the equipment blank contamination had no impact on the project data. Overall, all field QC criteria were met.

IX. INTERNAL STANDARDS

Internal standard (IS) area counts and retention times for samples analyzed on March 2 through 6, 2004 were within validation criteria. IS area counts for all samples analyzed were within -50 - +100 percent of the IS area count from the daily calibration standard. IS retention times were within ±30 seconds from the retention time of the associated daily standard.

X.TARGET COMPOUND IDENTIFICATION

All positive compound identifications were confirmed through the mass spectra library.

XI. COMPOUND QUANTITATION

Several positive results were recalculated to ensure that compound quantitation was accurate. No errors were encountered. Compound quantitation was based on the initial calibration average RF.

XII. SYSTEM PERFORMANCE

The system performance was acceptable.

XIII. OVERALL ASSESSMENT OF VOC DATA

All QC criteria evaluated during data validation of the VOC analyses were within acceptable limits. No QC issues were encountered that were significant enough to require qualification of the data. Therefore, all VOC data can be used as reported and meet the project objectives.

1,4-DIOXANE DATA ASSESSMENT

Five samples were analyzed for low-level 1,4-dioxane. Because there is no analytical method promulgated by EPA for the analysis of low-level 1,4-dioxane, Del Mar followed a modified EPA Method 8270C method, using isotopic dilution with GC/MS. Method 8270C QC criteria were used during this review to assess data for general compliance. Data reviewed for the 1,4-dioxane analyses include: holding times, instrument calibration, blank results, LCS recoveries, and MS/MSD recoveries and precision.

I. TECHNICAL HOLDING TIMES

According to Method 8270C, the holding time for 1,4-dioxane in water is 7 days from sample collection until extraction; and 40 days from extraction to analysis. The five samples were extracted on February 25, 2004, which is less than one day from sample collection, and analyzed on February 27, 2004. Therefore, all holding times were met.

II. INITIAL CALIBRATION

Initial calibration of GC/MS #5 was performed on November 22, 2003, using seven standard concentrations ranging from 0.2 to 10 ug/L, which meet the 8270C requirement of initial calibration using five concentration levels. The percent relative standard deviation (%RSD) of the response factors over the entire calibration curve was 6.9 percent, which meets general criteria (specified in Method 8000) of less than 15 percent. Therefore, the calibration curve was considered linear.

III. CONTINUING CALIBRATION

The initial calibration of GC/MS #5 was verified prior to sample analysis by analyzing 2 ug/L standard (mid point of the curve). The difference between the continuing calibration verification standard and the initial value was 12 percent, which demonstrates that the initial calibration was valid.

IV. METHOD BLANKS

A method blank was analyzed with this batch of samples to verify that the instrument is free from contamination. 1,4-Dioxane was not detected at a concentration above the reporting limit of 0.5 ug/L in the method blank. Therefore, no further action is required.

V. LABORATORY CONTROL SAMPLES (LCS)

One LCS sample was analyzed with this batch of samples, which meets Method 8270C criteria. Results from the LCS sample were included in the analytical report. The LCS recovery for 1,4-dioxane in the batch of samples was 60 percent, which is within the acceptable range of 35 to 120 percent (established by Del Mar). Therefore, acceptable accuracy was demonstrated and no further action is required.

VI. MATRIX SPIKE/MATRIX SPIKE DUPLICATES

One MS and MSD sample set was analyzed with the batch of samples analyzed on February 27, 2004. Acceptance limits for MS and MSD recoveries were determined by the laboratory to be 35 to 120 percent. The percent recoveries for the MS and MSD samples were within the acceptance criteria, which suggest that significant interferences from the sample matrix did not occur. Therefore, all criteria were met. Furthermore, the RPD between the MS and MSD recoveries was 1 percent, which demonstrates acceptable precision.

VII. REGIONAL QUALITY ASSURANCE AND QUALITY CONTROL

Sample OC-GW-OW9-022504 was submitted as a duplicate of sample OC-GW-OW3-022504. 1,4-Dioxane was detected in the primary sample at a concentration of 0.51 ug/L, which is just slightly higher than the reporting limit of 0.50 ug/L. 1,4-Dioxane was not detected in the duplicate sample. Because the concentration reported in the primary sample was less than five times the reporting limit, the difference in duplicate sample concentrations is not significant and qualification is not warranted.

Also, sample OC-GW-OW10-022504, an equipment blank, was submitted for analysis. 1,4-Dioxane was not detected in the blank. Therefore, all field QC criteria were met.

VIII. INTERNAL STANDARDS

Internal standard (IS) area counts and retention times for samples analyzed on February 27, 2004 were within validation criteria. IS area counts for all samples analyzed were within -50 - +100 percent of the IS area count from the daily calibration standard. IS retention times were within ±30 seconds from the retention time of the associated daily standard.

IX. TARGET COMPOUND IDENTIFICATION

All positive compound identifications were confirmed through the mass spectra library.

X.COMPOUND QUANTITATION

Two positive results were recalculated to ensure that compound quantitation was accurate. No errors were encountered. Compound quantitation was based on the initial calibration average RF.

XI. SYSTEM PERFORMANCE

The system performance was acceptable.

XII. OVERALL ASSESSMENT OF 1,4-DIOXANE DATA

Although no EPA method exists for the analysis of low-level 1,4-dioxane, the project data were reviewed for general compliance with standard QC criteria requirements specified for organic analyses. Also, QC sample results were evaluated against laboratory specified acceptance criteria for method compliance. No significant QC issues were encountered during the data review. Therefore, the 1,4-dioxane data can be used for the project purposes without qualification.

DATA VALIDATION REPORT
CLP-LIKE DATA PACKAGE

Project: Omega Chemical Superfund Site
Groundwater Monitoring Well Sampling – August 2003

References: USEPA CLP National Functional Guidelines for Organic Data Review October 1999 (EPA540/R-99/008)

SW-846 Method 8000B, December 1996
SW-846 Method 8260B, December 1996
SW-846 Method 8270C, December 1996

Reviewer: Barbara Wells
CDM - Carlsbad, California

Date: December 2004

Analytical Laboratory: Del Mar Analytical (Del Mar)
Irvine, California 92614

DATA REVIEW

Four water samples (listed below) were collected on August 26, 2003, and transported to Del Mar Analytical. All samples were collected from groundwater monitoring wells and were analyzed for the following: volatile organic compounds (VOCs) by EPA Method 8260B and 1,4-dioxane by EPA Method 8270 (modified). Sample identification and collection dates are summarized in the following table.

Sample Summary Table

Sample ID	*Lab Sample ID*	*Sample Type* [1]	*Date Collected*
OC-GW-OW3-082603	IMH1415-01	GW	8/26/03
OC-GW-OW1-082603	IMH1415-02	GW	8/26/03
OC-GW-OW1b-082603	IMH1415-03	GW	8/26/03
OC-GW-OW7-082603	IMH1415-04	GW	8/26/03

Notes:
[1] GW = Groundwater sample

VOLATILE ORGANIC COMPOUNDS ASSESSMENT - METHOD 8260B

I. TECHNICAL HOLDING TIMES

All technical holding times requirements were met. Water samples were analyzed between September 2 and 4, 2003, which is within the 14-day holding time criteria.

II. INITIAL CALIBRATION

Initial calibration of the instrument must be performed using a minimum of five standard concentrations. For initial calibration to be accepted, five system performance check compounds (SPCCs) must meet the following minimum average response factors (RFs):

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

SPCCs are used to check compound instability and to check for degradation caused by contaminated lines or active sites in the system. The average RF for each of the five SPCCs met the minimum calibration criteria listed above.

Additionally, the relative standard deviation (RSD) of the response factors of the initial calibration curve should be less than or equal to 15 percent for all target analytes and less than or equal to 30 percent for six calibration check compounds (CCCs). The six CCCs are: 1,1-dichloroethene, chloroform, 1,2-dichloropropane, toluene, ethylbenzene and vinyl chloride. If the RSD of the target analytes is 15 percent or less and less than 30 percent for the six CCCs, then the RF is assumed to be constant over the calibration range and the average RF can be used for quantitation.

If the RSD of the target analytes exceeds the 15 percent criterion, other calibration options can be employed. As discussed in Section 7.0 of Method 8000, linear calibration using a least squares regression may be used with the initial calibration data to demonstrate the instrument calibration linearity. Least squares regression was used for the target analytes listed above, which did not have an average RF of 15 percent or less. For initial calibration to be accepted using a least squares model, the coefficient of determination must be greater than or equal to 0.99.

Initial calibration of GC/MS #32 was performed on August 5, 2003 using a minimum of five concentrations ranging from 0.5 to 200 µg/L, which meet the method requirement of initial calibration using five concentration levels. GC/MS #32 was used to analyze samples collected from wells OW3 and OW1 on September 2, 2003. All target analytes and CCCs met the 15 percent calibration criteria except for bromochloromethane, bromoform and 1,2-dibromo-3-chloropropane. The coefficient of determination exceeded 0.99 for these compounds. All criteria for initial calibration were met for all compounds and no qualification is necessary.

Initial calibration of GC/MS #1 was performed on August 5, 2003 using a minimum of five concentrations ranging from 0.5 to 200 µg/L, which meet the method requirement of initial calibration using five concentration levels. GC/MS #1 was used to analyze samples collected from OW1b and OW7 and to re-analyze samples collected from OW3 and OW1 at higher dilutions (20 and 50 times, respectively) on September 3, 2003. Ten target analytes exceeded the 15 percent calibration criteria for GC/MS #1 but had coefficients of determination that exceeded 0.99. Therefore, all criteria for initial calibration of GC/MS #q were met for all compounds and no qualification is necessary.

Initial calibration of GC/MS #9 was performed on August 25, 2003 using a minimum of five concentrations ranging from 0.5 to 200 µg/L, which meet the method requirement of initial calibration using five concentration levels. GC/MS #9 was used to re-analyze sample OW1 on September 4, 2003 at a dilution factor of 1000. All target analytes and CCCs met the 15 percent calibration criteria for GC/MS #9 except for bromoform, dibromochloromethane and 1,2-dibromo-3-chloropropane. The coefficient of determination exceeded 0.99 for these compounds. All criteria for initial calibration of GC/MS #9 were met for all compounds and no qualification is necessary.

III. CONTINUING CALIBRATION

The initial GC/MS calibration is verified once every 12 hours by analyzing a 4-bromofluorobenzene tuning standard and a calibration verification standard (a midpoint check standard) and prior to analyzing any samples. The calibration verification standard must contain each of the five SPCCs used during initial calibration. The minimum RF for each SPCC must meet the criteria specified for initial calibration (i.e., 0.10 to 0.30). In addition, initial calibration is checked using the CCCs used during initial calibration. If the percent difference (%D) of each of the CCCs is less than 20 percent, the initial calibration is assumed to be valid.

Samples were analyzed on September 2 (GC/MS #32), 3 (GC/MS #1) and 4 (GC/MS #9), 2004. Prior to sample analysis, a 50 ng BFB tuning standard was analyzed. Mass ion abundance criteria were met for the system. Each of the five SPCCs and the six CCCs were contained in a mid-point check standard at concentrations of 25 ppb. The RF for each of the SPCCs was greater than the criteria specified and the %D between the continuing calibration and the initial calibration for each of the CCCs was less than 20 percent for each batch of samples. Therefore, the initial calibrations were validated and continuing calibration criteria were met.

IV. METHOD BLANKS

A method blank must be analyzed with each batch of samples for each matrix type immediately after initial calibration is verified and before sample analysis. A total of three method blanks were reported, which correspond to the three analytical batches.

No target analytes were detected at concentrations above their respective reporting limits in the blanks analyzed on September 2, 3 and 4, 2003.

V. SURROGATES

Three surrogate spikes (dibromofluoromethane, toluene-d8 and 4-bromofluorobenzene) were added to each environmental sample, QC sample, and method blank, as required by the method. Surrogate control limits were established by the laboratory and are 80 to 120 percent for all three surrogates.

All surrogate recoveries were within the acceptable control limits.

VI. MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Three MS and MSD sample sets were analyzed with this group of samples. Acceptance limits for MS and MSD recoveries and the relative percent difference (RPD) between the MS and the MSD were statistically determined by the laboratory and were provided with the laboratory report for each analyte.

Except for naphthalene and TCE in one batch of samples, the percent recoveries for all other MS and MSD samples were within the acceptance criteria for all spiked compounds. Naphthalene was reported in the MSD analyzed on September 3, 2003 at 49 percent, which is slightly below the lower control limit of 50 percent; and TCE was reported in the same MSD at 69 percent, which is slightly below the lower control limit of 70 percent. Because the corresponding MS and LCS recoveries were both within acceptable limits, qualification of the data was not warranted. Therefore, no further action was required.

The relative percent difference (RPD) between the MS and MSD samples were within acceptable criteria for all compounds in each of the analytical batches. Therefore, acceptable precision was demonstrated.

VII. LABORATORY CONTROL SAMPLES (LCS)

Three LCS samples were analyzed, which meets the analytical method requirement of one LCS per analytical batch. Results from the LCS sample were included in the analytical report. All LCS analyte recoveries were within the acceptance limits established by the laboratory, which demonstrates acceptable accuracy.

VIII. REGIONAL QUALITY ASSURANCE AND QUALITY CONTROL

No duplicates or field blanks were submitted with this group of samples.

IX. INTERNAL STANDARDS

Internal standard (IS) area counts and retention times for samples analyzed on September 2 through 4, 2003 were within validation criteria. IS area counts for all samples analyzed were within -50 - +100 percent of the IS area count from the daily calibration standard. IS retention times were within ±30 seconds from the retention time of the associated daily standard.

X. TARGET COMPOUND IDENTIFICATION

All positive compound identifications were confirmed through the mass spectra library.

XI. COMPOUND QUANTITATION

Several positive results were recalculated to ensure that compound quantitation was accurate. No errors were encountered. Compound quantitation was based on the initial calibration average RF.

XII. SYSTEM PERFORMANCE

The system performance was acceptable.

XIII. OVERALL ASSESSMENT OF VOC DATA

All QC criteria evaluated during data validation of the VOC analyses were within acceptable limits. No QC issues were encountered that were significant enough to reject or qualify the data. Therefore, all VOC data can be used as reported and meet the project objectives.

1,4-DIOXANE DATA ASSESSMENT

Four samples were analyzed for low-level 1,4-dioxane. Because there is no analytical method promulgated by EPA for the analysis of low-level 1,4-dioxane, Del Mar followed a modified EPA Method 8270C method, using isotopic dilution with GC/MS. Method 8270C QC criteria were used during this review to assess data for general compliance. Data reviewed for the 1,4-dioxane analyses include: holding times, instrument calibration, blank results, LCS recoveries, and MS/MSD recoveries and precision.

I. TECHNICAL HOLDING TIMES

According to Method 8270C, the holding time for 1,4-dioxane in water is 7 days from sample collection until extraction; and 40 days from extraction to analysis. The samples were extracted on August 28, 2003, which is two days from sample collection, and analyzed on September 3 and 4, 2003. Therefore, all holding times were met.

II. INITIAL CALIBRATION

Initial calibration of GC/MS #5 was performed on July 24, 2003, using seven standard concentrations ranging from 0.2 to 10 ug/L, which meet the 8270C requirement of initial calibration using five concentration levels. The percent relative standard deviation (%RSD) of the response factors over the entire calibration curve was 8.7 percent, which meets general criteria (specified in Method 8000) of less than 15 percent. Therefore, the calibration curve was considered linear.

III. CONTINUING CALIBRATION

The initial calibration of GC/MS #5 was verified prior to sample analysis by analyzing a 2 ug/L standard (mid point of the curve). The difference between the continuing calibration verification standard and the initial value was 8.9 percent on September 3 and 5.6 percent on September 4, 2003, which demonstrate that the initial calibrations were valid.

IV. METHOD BLANKS

Method blanks were analyzed with the two batches of samples to verify that the instrument is free from contamination. 1,4-Dioxane was detected at a concentration of 0.965 ug/l in the blank analyzed on September 3, 2003, which is above the reporting limit of 0.5 ug/L. One sample, collected from well OW3, contained 1,4-dioxane at a concentration of 1.6 ug/l, which is less than 5 times the blank concentration. As a result, this result was qualified with a "UB" to indicate a non-detectable concentration due to method blank contamination. All other samples contained 1,4-dioxane at levels greater than five times the blank concentration.

V. LABORATORY CONTROL SAMPLES (LCS)

One LCS sample was analyzed with this batch of samples, which meets Method 8270C criteria. Results from the LCS sample were included in the analytical report.

The LCS recovery for 1,4-dioxane in the batch of samples was 86 percent, which is within the acceptable range of 35 to 120 percent (established by Del Mar). Therefore, acceptable accuracy was demonstrated and no further action is required.

VI. MATRIX SPIKE/MATRIX SPIKE DUPLICATES

MS and MSD recoveries were not reported with this batch of samples. Acceptable accuracy was demonstrated by the successful analysis of the LCS.

VII. REGIONAL QUALITY ASSURANCE AND QUALITY CONTROL

No duplicates or field blanks were submitted with this group of samples.

VIII. INTERNAL STANDARDS

Internal standard (IS) area counts and retention times for samples analyzed on September 3 and 4, 2003 were within validation criteria. IS area counts for all samples analyzed were within -50 - +100 percent of the IS area count from the daily calibration standard. IS retention times were within ±30 seconds from the retention time of the associated daily standard.

IX. TARGET COMPOUND IDENTIFICATION

All positive compound identifications were confirmed through the mass spectra library.

X.COMPOUND QUANTITATION

Positive results were recalculated to ensure that compound quantitation was accurate. No errors were encountered. Compound quantitation was based on the initial calibration average RF.

XI. SYSTEM PERFORMANCE

The system performance was acceptable.

XII. OVERALL ASSESSMENT OF 1,4-DIOXANE DATA

Although no EPA method exists for the analysis of low-level 1,4-dioxane, the project data were reviewed for general compliance with standard QC criteria requirements specified for organic analyses. Also, QC sample results were evaluated against laboratory specified acceptance criteria for method compliance. No significant QC issues were encountered during the data review. Except for one result, the 1,4-dioxane data can be used for the project purposes without qualification. Due to method blank contamination, the concentration reported in OW3 was qualified as non-detectable.

DATA VALIDATION REPORT
CLP-LIKE DATA PACKAGE

Project: Omega Chemical Superfund Site
Groundwater Monitoring Well Sampling – February 2003

References: USEPA CLP National Functional Guidelines for Organic Data Review October 1999 (EPA540/R-99/008)

USEPA CLP National Functional Guidelines for Inorganic Data Review July 2002 (EPA 540-R-01-008)

SW-846 Method 8000B, December 1996
SW-846 Method 8260B, December 1996
SW-846 Method 8270C, December 1996
SW-846 Method 7199, December 1996

EPA Method 300.0, 1993
EPA Method 314, 1999
EPA Method 415.1, 1974

Reviewer: Barbara Wells
CDM - Carlsbad, California

Date: May 2003

Analytical Laboratory: Del Mar Analytical (Del Mar)
Irvine, California 92606

DATA REVIEW

Four water samples (listed below) were collected on February 19, 2003, and transported to Del Mar Analytical. Three of the samples were collected from groundwater monitoring wells and analyzed for the following: volatile organic compounds (VOCs) by EPA Method 8260B; 1,4-dioxane by EPA Method 8270 (modified), hexavalent chromium by EPA Method 7199, perchlorate by EPA Method 314, nitrate/nitrite by EPA Method 300 and dissolved organic carbon (DOC) by EPA Method 9060. The fourth sample was a trip blank and submitted for the analysis of VOCs by EPA Method 8260B. Sample identification and collection dates are summarized in the following table.

Sample Summary Table

Sample ID	Lab Sample ID	Sample Type [1]	Date Collected
OC-GW-OW1-021903	IMB1120-01	GW	2/19/03
OC-GW-OW2-021903	IMB1120-02	GW	2/19/03
OC-GW-OW1B-021903	IMB1120-03	GW	2/19/03
Trip Blank01-021903	IMB1120-04	M	2/19/03

Notes:
[1] GW = Groundwater sample
M = Trip Blank

VOLATILE ORGANIC COMPOUNDS ASSESSMENT - METHOD 8260B

I. TECHNICAL HOLDING TIMES

All technical holding times requirements were met. Water samples were analyzed between February 21 and 23, which is within the 14-day holding time criteria.

II. INITIAL CALIBRATION

Initial calibration of the instrument must be performed using a minimum of five standard concentrations. For initial calibration to be accepted, five system performance check compounds (SPCCs) must meet the following minimum average response factors (RFs):

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

SPCCs are used to check compound instability and to check for degradation caused by contaminated lines or active sites in the system. The average RF for each of the five SPCCs met the minimum calibration criteria listed above.

Additionally, the relative standard deviation (RSD) of the response factors of the initial calibration curve should be less than or equal to 15 percent for all target analytes and less than or equal to 30 percent for six calibration check compounds

(CCCs). The six CCCs are: 1,1-dichloroethene, chloroform, 1,2-dichloropropane, toluene, ethylbenzene and vinyl chloride. If the RSD of the target analytes is 15 percent or less and less than 30 percent for the six CCCs, then the RF is assumed to be constant over the calibration range and the average RF can be used for quantitation.

If the RSD of the target analytes exceeds the 15 percent criterion, other calibration options can be employed. As discussed in Section 7.0 of Method 8000, linear calibration using a least squares regression may be used with the initial calibration data to demonstrate the instrument calibration linearity. Least squares regression was used for the target analytes listed above, which did not have an average RF of 15 percent or less. For initial calibration to be accepted using a least squares model, the coefficient of determination must be greater than or equal to 0.99.

Initial calibration of GC/MS #33 was performed on January 20, 2003 using a minimum of five concentrations ranging from 0.5 to 200 µg/L, which meets the method requirement of initial calibration using five concentration levels. GC/MS #33 was used to analyze samples on February 21, 2003. All target analytes and CCCs met the 15 percent calibration criteria for GC/MS #33 except for dichlorodifluoromethane, trichlorofluoromethane, dibromochloromethane, and bromoform. The coefficient of determination exceeded 0.99 for these four compounds. All criteria for initial calibration of GC/MS #33 were met for all compounds and no qualification is necessary.

Initial calibration of GC/MS #34 was performed on January 30, 2003 using a minimum of five concentrations ranging from 0.5 to 200 µg/L, which meets the method requirement of initial calibration using five concentration levels. GC/MS #34 was used to analyze samples on February 22 and 23, 2003. All target analytes and CCCs met the 15 percent calibration criteria for GC/MS #33 except for dichlorodifluoromethane, trichlorofluoromethane, 2-chlorovinylethylether, bromoform, 1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, and 1,2-dibromo-3-chloropropane. The coefficient of determination exceeded 0.99 for these six compounds. All criteria for initial calibration of GC/MS #33 were met for all compounds and no qualification is necessary.

III. CONTINUING CALIBRATION

The initial GC/MS calibration is verified once every 12 hours by analyzing a 4-bromofluorobenzene tuning standard and a calibration verification standard (a midpoint check standard) and prior to analyzing any samples. The calibration verification standard must contain each of the five SPCCs used during initial calibration. The minimum RF for each SPCC must meet the criteria specified for initial calibration (i.e., 0.10 to 0.30). In addition, initial calibration is checked using the CCCs used during initial calibration. If the percent difference (%D) of each of the CCCs is less than 20 percent, the initial calibration is assumed to be valid.

Samples were analyzed on February 21 (GC/MS #33), 22 and 23 (GC/MS #34). Prior to sample analysis, a 50 ng BFB tuning standard was analyzed. Mass ion abundance criteria were met for the system. Each of the five SPCCs and the six CCCs were contained in a mid-point check standard at concentrations of 25 ppb. The RF for each of the SPCCs was greater than the criteria specified and the %D between the continuing calibration and the initial calibration for each of the CCCs was less than 20 percent. Therefore, the initial calibrations were validated and continuing calibration criteria were met.

IV. METHOD BLANKS

A method blank must be analyzed with each batch of samples for each matrix type immediately after initial calibration is verified and before sample analysis. A total of three method blanks were reported, which correspond to the three analysis dates. No target analytes were detected at concentrations above their respective reporting limits in the blanks analyzed on February 21, 22 and 23, 2003. Therefore, all criteria were met and no further action is required.

V. SURROGATES

Three surrogate spikes (dibromofluoromethane, toluene-d8 and 4-bromofluorobenzene) were added to each environmental sample, QC sample, and method blank, as required by the method. Surrogate control limits were established by the laboratory and are 80 to 120 percent for all three surrogates.

All surrogate recoveries were within the acceptable control limits, except for one surrogate (4-bromofluorobenzene [4-BFB]) reported in one matrix spike (MS) and one matrix spike duplicate (MSD). Recoveries for 4-BFB in the MS and MSD samples analyzed on February 21, 2003 exceeded the upper control limit of 120 percent. Because the other two surrogates in the MS and MSD samples were within control, qualification of the data is not required.

VI. MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Three MS and MSD sample sets were analyzed with this group of samples. Acceptance limits for MS and MSD recoveries and the relative percent difference (RPD) between the MS and the MSD were statistically determined by the laboratory, which meets method requirements, and are listed in the following table:

MS/MSD Acceptance Limits

Spiking Analyte	*Acceptance Limits*	
	MS/MSD Recovery (%)	*RPD*
Benzene	60-125	20
Bromodichloromethane	70-140	20
Bromoform	50-140	30
Chlorobenzene	75-125	20
Dibromochloromethane	65-145	25
1,4-Dichlorobenzene	70-120	20

Spiking Analyte	Acceptance Limits	
	MS/MSD Recovery (%)	RPD
1,1-Dichloroethane	65-135	20
1,2-Dichloroethane	60-150	25
Ethylbenzene	65-125	20
Methyl tert-butyl ether (MTBE)	55-155	30
Naphthalene	50-145	30
Toluene	65-125	20
Vinyl Chloride	40-135	20
m,p-Xylenes	65-120	20
o-Xylene	65-125	20

Except for the MS/MSD sample pair analyzed on February 21, 2003, the percent recoveries for the MS and MSD samples were within the acceptance criteria for all spiked compounds. Nearly all recoveries in both the MS and MSD samples for aromatic compounds exceeded the upper control limits. All detected sample concentrations in the project samples analyzed in this batch were flagged with the laboratory with an "M" to indicate an out-of-range recovery. Of the three samples analyzed in this batch (OW-1, OW-2 and the Trip Blank), only OW-1 contained detectable concentrations of aromatic compounds that may be affected by the high MS/MSD recoveries. Because no other QC deficiencies were noted and acceptable accuracy was demonstrated by the successful analysis of the corresponding LCS, qualification of the data was not warranted.

The relative percent difference (RPD) between the MS and MSD samples were within acceptable criteria for all compounds in the three analytical batches except for bromodichloromethane (analyzed on February 21, 2003), MTBE and naphthalene (analyzed on February 22, 2003), and MTBE (analyzed on February 23, 2003). Because none of these compounds were detected in the associated samples, the slightly poor precision does not affect the project data. Therefore, qualification is not warranted.

VII. LABORATORY CONTROL SAMPLES (LCS)

Three LCS samples were analyzed with each batch of samples, which meets the analytical method requirement of one LCS per analytical batch. Results from the LCS sample were included in the analytical report. All LCS analyte recoveries were within the acceptance limits established by the laboratory, which demonstrates acceptable accuracy.

VIII. REGIONAL QUALITY ASSURANCE AND QUALITY CONTROL

No field duplicates were submitted with this data package. One trip blank was submitted and analyzed for VOCs. No target analytes were detected in the trip blank, which demonstrates that cross-contamination during sample transport and storage did not occur.

IX. INTERNAL STANDARDS

Internal standard (IS) area counts and retention times for samples analyzed on February 21 through 23, 2003 were within validation criteria. IS area counts for all samples analyzed were within -50 - +100 percent of the IS area count from the daily calibration standard. IS retention times were within ±30 seconds from the retention time of the associated daily standard.

X.TARGET COMPOUND IDENTIFICATION

All positive compound identifications were confirmed through the mass spectra library.

XI. COMPOUND QUANTITATION

Several positive results were recalculated to ensure that compound quantitation was accurate. No errors were encountered. Compound quantitation was based on the initial calibration average RF.

XII. SYSTEM PERFORMANCE

The system performance was acceptable.

XIII. OVERALL ASSESSMENT OF VOC DATA

All QC criteria evaluated during data validation of the VOC analyses were within acceptable limits. No QC issues were encountered that were significant enough to require qualification of the data. Therefore, all VOC data can be used as reported and meet the project objectives.

1,4-DIOXANE DATA ASSESSMENT

Three samples were analyzed for low-level 1,4-dioxane. Because there is no analytical method promulgated by EPA for the analysis of low-level 1,4-dioxane, Del Mar followed a modified EPA Method 8270C method, using isotopic dilution with GC/MS. Method 8270C QC criteria were used during this review to assess data for general compliance. Data reviewed for the 1,4-dioxane analyses include: holding times, instrument calibration, blank results, LCS recoveries, and MS/MSD recoveries and precision.

I. TECHNICAL HOLDING TIMES

According to Method 8270C, the holding time for 1,4-dioxane in water is seven days from sample collection until extraction; and 40 days from extraction to analysis. The three samples (OW-1, OW-2 and OW-1B) were extracted on February 20, 2003, which is one day from sample collection, and analyzed on February 21, 2003.

II. INITIAL CALIBRATION

Initial calibration of GC/MS #5 was performed on November 19, 2002, using seven standard concentrations ranging from 0.2 to 10 ug/L, which meets the 8270C requirement of initial calibration using five concentration levels. The percent relative standard deviation (%RSD) of the response factors over the entire calibration curve was 5.5 percent, which meets general criteria (specified in Method 8000) of less than 15 percent. Therefore, the calibration curve was considered linear.

III. CONTINUING CALIBRATION

The initial calibration of GC/MS #5 was verified prior to sample analysis by analyzing 2 ug/L standard (mid point of the curve). The difference between the continuing calibration verification standard and the initial value was 5.9 percent, which demonstrates that the initial calibration was valid.

IV. METHOD BLANKS

A method blank was analyzed with this batch of samples to verify that the instrument is free from contamination. 1,4-Dioxane was not detected at a concentration above the reporting limit of 0.5 ug/L in the method blank. Therefore, no further action is required.

V. LABORATORY CONTROL SAMPLES (LCS)

One LCS sample was analyzed with this batch of samples, which meets Method 8270C criteria. Results from the LCS sample were included in the analytical report. The LCS recovery for 1,4-dioxane in the batch of samples was 62 percent, which is within the acceptable range of 40 to 120 percent (established by Del Mar). Therefore, acceptable accuracy was demonstrated and no further action is required.

VI. MATRIX SPIKE/MATRIX SPIKE DUPLICATES

One MS and MSD sample set was analyzed with the batch of samples analyzed on February 21, 2003. Acceptance limits for MS and MSD recoveries were determined by the laboratory to be 40 to 120 percent. The percent recoveries for the MS and MSD samples were within the acceptance criteria, which suggest that significant interferences from the sample matrix did not occur. Therefore, all criteria were met. Furthermore, the RPD between the MS and MSD recoveries was 3 percent, which demonstrates acceptable precision.

VII. REGIONAL QUALITY ASSURANCE AND QUALITY CONTROL

No field duplicates were submitted with this sample group.

VIII. INTERNAL STANDARDS

Internal standard (IS) area counts and retention times for samples analyzed on February 21, 2003 were within validation criteria. IS area counts for all samples analyzed were within -50 - +100 percent of the IS area count from the daily calibration standard. IS retention times were within ±30 seconds from the retention time of the associated daily standard.

IX. TARGET COMPOUND IDENTIFICATION

All positive compound identifications were confirmed through the mass spectra library.

X. COMPOUND QUANTITATION

Several positive results were recalculated to ensure that compound quantitation was accurate. No errors were encountered. Compound quantitation was based on the initial calibration average RF.

XI. SYSTEM PERFORMANCE

The system performance was acceptable.

XII. OVERALL ASSESSMENT OF 1,4-DIOXANE DATA

Although no EPA method exists for the analysis of low-level 1,4-dioxane, the project data were reviewed for general compliance with standard QC criteria requirements specified for organic analyses. Also, QC sample results were evaluated against laboratory specified acceptance criteria for method compliance. No significant QC issues were encountered during the data review. Therefore, the 1,4-dioxane data can be used for the project purposes without qualification.

NITRATE ASSESSMENT - METHOD 300.0

Three samples were analyzed for nitrate using EPA Method 300.0.

I. TECHNICAL HOLDING TIMES

The holding time for nitrate in water is 48 hours. All samples submitted for nitrate analysis were collected on February 19, and analyzed on February 20, 2003. Therefore, all samples were analyzed within 48 hours, which meets the holding time criteria.

II. CALIBRATION

For a calibration curve, a minimum of three calibration standards is required. Initial calibration was performed on February 11, 2003. Del Mar used four calibration standards ranging from 0.5 to 20 mg/L, which meets method criteria. For calibration to be accepted, an initial calibration check standard must be analyzed prior to sample analysis and must be within 85 to 115 percent of the true value. The calibration check standard recovery for nitrate was 98 percent, which meets acceptance criteria. Therefore, no action is required.

III. BLANKS

For Method 300.0, at least one laboratory reagent blank must be analyzed with each batch of samples, in accordance with the method requirements. Nitrate was not detected above the reporting limit of 0.11 mg/L in the method blank analyzed with this group of samples. Therefore, all method blank criteria were met.

IV. LABORATORY CONTROL SAMPLES

The laboratory control sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. For EPA Method 300.0, all aqueous LCS percent recoveries must be within 90 to 110 percent. If the recoveries do not fall within the acceptable limits, sample results may be qualified.

The recovery for the nitrate LCS samples was 96 percent, which is within acceptance criteria. No further action is required.

V. MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLE ANALYSIS

Method 300.0 requires that one matrix spike be analyzed for each sample batch (1/20 samples). As required by Method 300.0, MS recoveries should be within acceptance limits of 80 to 120 percent. Del Mar also analyzed an MSD to meet the requirement of one duplicate sample per analytical batch to assess precision.

One MS/MSD sample set was analyzed with the group of samples. The percent recoveries for the MS and MSD samples were 65 and 66 percent, respectively, which are not within acceptable control limits. Del Mar reported that high concentrations of non-target analytes were detected in the sample, which affected the recoveries of the MS and MSD samples. Because acceptable accuracy was demonstrated by the successful analysis of the corresponding LCS and because no other significant QC issues were observed, qualification is not required.

VI. FIELD DUPLICATES

No field duplicates were submitted with this group of samples.

VII. OVERALL ASSESSMENT

In general, the overall performance of the nitrate analyses was very good. No QC deficiencies significant enough to warrant qualification were encountered during review of the data. Therefore, the results are acceptable and can be used for the project purposes without qualification.

PERCHLORATE ASSESSMENT - METHOD 314

Three samples were analyzed for perchlorate using EPA Method 314.

I. TECHNICAL HOLDING TIMES

The holding time for perchlorate in water is 28 days. All samples submitted for perchlorate analysis were collected on February 19, 2003 and analyzed on February 20, 2003. Therefore, all samples were analyzed within 28 days, which meets the holding time criteria.

II. CALIBRATION

For a calibration curve, a minimum of three calibration standards is required. Del Mar used six calibration standards (ranging from 2 to 100 µg/L), which meets method criteria. Initial calibration was performed on February 5, 2003. For calibration to be accepted, an initial calibration check standard must be analyzed prior to sample analysis and must be within ± 10 percent of the initial values. The calibration check standard (25 ug/L) recovery for perchlorate was 106 percent, which meets acceptance criteria. Therefore, no action is required.

III. BLANKS

For Method 314, at least one laboratory reagent blank must be analyzed with each batch of samples, in accordance with the method requirements. Perchlorate was not detected above the reporting limit of 4.0 µg/L in the blank analyzed with this group of samples. Therefore, all method blank criteria were met.

IV. LABORATORY CONTROL SAMPLES

The LCS serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. For EPA Method 314, all aqueous LCS percent recoveries must be within 90 to 110 percent. If the recoveries do not fall within the acceptable limits, the source of the problem should be identified and resolved.

The recovery for the perchlorate LCS samples was 101 percent, which is within acceptance criteria. No further action is required.

V. MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLE ANALYSIS

Method 314 requires that one matrix spike be analyzed on a minimum of 10 percent of the samples. MS recoveries should be within acceptance limits of 80 to 120 percent. Del Mar also analyzed an MSD to meet the requirement of one duplicate sample per analytical batch to assess precision.

One MS/MSD sample set was analyzed with the group of samples. The percent recoveries for the MS and MSD samples were 102 percent, which are within acceptable control limits. Therefore, all criteria were met for accuracy and precision and no further action is warranted.

VI. FIELD DUPLICATES

No field duplicates were submitted with this group of samples.

VII. OVERALL ASSESSMENT

The overall performance of the perchorate analyses was good. No QC deficiencies were encountered during review of the available data. Therefore, the results are acceptable and can be used for the project purposes without qualification.

HEXAVALENT CHROMIUM EVALUATION - METHOD 7199

Three samples were analyzed for hexavalent chromium using EPA Method 7199.

I. TECHNICAL HOLDING TIMES

The holding time for hexavalent chromium in water is 24 hours. All samples submitted for hexavalent chromium analysis were collected on February 19, 2003 and analyzed on February 20, 2003. Therefore, all samples were analyzed within 24 hours, which meets the holding time criteria.

II. CALIBRATION

One blank and seven calibration standards (ranging from 0.3 to 100 μg/L) were used to generate an initial calibration curve, which meets the method criteria of one blank plus a minimum of three calibration standards. The calibration curve of analyte response versus analyte concentrations was generated, which resulted in a correlation coefficient greater than 0.999. Therefore, the calibration curve was accepted and considered linear. All calibration data met the method criteria for hexavalent chromium analysis.

III. BLANKS

For Method 7199, at least one instrument blank must be analyzed every 10 samples to check for contamination. Hexavalent chromium was not detected in the instrument blank. Therefore, all method blank criteria were met.

IV. LABORATORY CONTROL SAMPLES

The laboratory control sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. LCS, or calibration check standards, must be analyzed every 10 samples. For EPA Method 7199, all aqueous LCS percent recoveries must be within 90 to 110 percent. If the recoveries do not fall within the acceptable limits, the instrument must be re-calibrated and the previous ten samples must be reanalyzed.

The recovery for the hexavalent chromium LCS was 103 percent, which is within acceptance criteria. No further action is required.

V. MATRIX SPIKE, MATRIX SPIKE DUPLICATE SAMPLE ANALYSIS

At least one duplicate sample and one matrix spike sample must be analyzed per sample batch to check for precision and matrix spike recovery. To meet these criteria, Del Mar analyzed one MS and MSD pair with the sample batch. MS and MSD recoveries must be within 85 to 115 percent, and the precision limit must be within 15 percent.

The MS and MSD recoveries for this sample batch were 101percent each, which is within the acceptance criteria for both accuracy and precision. Therefore, all spike and duplicate criteria for Method 7199 were met and no further action was required.

VI. FIELD DUPLICATES

No field duplicates were submitted with this group of samples.

VII. OVERALL ASSESSMENT

The overall performance of the hexavalent chromium analyses was within acceptable limits. No QC deficiencies were encountered during review of the data. Therefore, the results are acceptable and can be used for the project purposes without qualification.

DISSOLVED ORGANIC CARBON (DOC) ASSESSMENT - METHOD 415.1

Three samples were analyzed for DOC using EPA Method 415.1.

I. TECHNICAL HOLDING TIMES

The holding time for DOC in water is 28 days. All samples submitted for DOC analysis were collected on February 19, 2003 and analyzed on February 27, 2003. Therefore, all samples were analyzed within seven days, which meets the holding time criteria.

II. CALIBRATION

Method 415.1 does not specify instrument calibration criteria.

III. BLANKS

For Method 415.1, at least one method blank must be analyzed with each batch of samples, in accordance with the method requirements. The DOC concentration detected in the method blank was less than the reporting limit of 1.0 mg/L. Therefore, the method blank criteria were met and no further action is required.

IV. LABORATORY CONTROL SAMPLES

The laboratory control sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Method 415.1 does not specify frequency or acceptance limits for the LCS. Del Mar specified an LCS acceptance criterion of 90 to 110 percent. If the recoveries do not fall within the acceptable limits, the instrument must be re-calibrated and the previous ten samples must be reanalyzed.

The recovery for the DOC LCS was 100 percent, which is within acceptance criteria. No further action is required.

V. MATRIX SPIKE, MATRIX SPIKE DUPLICATE SAMPLE ANALYSIS

Method 415.1 does not specify frequency or acceptance criteria for MS/MSD samples. Del Mar analyzed one MS and MSD pair with the sample batch. MS and MSD recoveries must be within 80 to 120 percent (established by Del Mar), and the precision limit must be within 20 percent.

The MS and MSD recoveries for this sample batch were 96 and 97 percent, respectively, which is within the acceptance criteria for both accuracy and precision. Therefore, all spike and duplicate criteria for Method 415.1 were met and no further action was required.

VI. FIELD DUPLICATES

No field duplicates were submitted with this group of samples.

VIII. OVERALL ASSESSMENT

No QC deficiencies were encountered in the assessment of the DOC data. Therefore, the results are acceptable and can be used for the project purposes without qualification.

DATA VALIDATION REPORT
CLP-LIKE DATA PACKAGE

Project: Omega Chemical Superfund Site
Groundwater Monitoring Well Sampling – August 2002

References: USEPA CLP National Functional Guidelines for Organic Data Review October 1999 (EPA540/R-99/008)

SW-846 Method 8000B, December 1996
SW-846 Method 8260B, December 1996
SW-846 Method 8270C, December 1996

Reviewer: Barbara Wells
CDM - Carlsbad, California

Date: May 2003

Analytical Laboratory: Del Mar Analytical (Del Mar)
Irvine, California 92606

DATA REVIEW

Five water samples (listed below) were collected on August 21 and 22, 2002, and transported to Del Mar Analytical. Three of the samples were collected from groundwater monitoring wells and analyzed for the following: volatile organic compounds (VOCs) by EPA Method 8260B; and 1,4-dioxane by EPA Method 8270 (modified). Weck Laboratories, located in the City of Industry, California, analyzed 1,4-Dioxane. The fourth sample was a duplicate and also analyzed for VOCs and 1,4-dioxane. The fifth sample was a trip blank and analyzed for VOCs only. Sample identification and collection dates are summarized in the following table.

Sample Summary Table

Sample ID	*Lab Sample ID*	*Sample Type* [1]	*Date Collected*
OC-GW-OW8-082202	ILH1043-01	GW	8/22/02
OC-GW-OW8K-082202	ILH1043-02	GW	8/22/02
OC-GW-OW5-082202	ILH1043-03	GW	8/22/02
OC-GW-OW4b-082102	ILH1043-04	GW	8/22/02

Sample ID	Lab Sample ID	Sample Type [1]	Date Collected
TB2	ILH1043-05	M	8/22/02

Notes:

[1] GW — Groundwater Sample

M — Trip Blank

VOLATILE ORGANIC COMPOUNDS ASSESSMENT - METHOD 8260B

I. TECHNICAL HOLDING TIMES

All technical holding times requirements were met. Water samples were analyzed between August 27 and 29, 2002, which is within the 14-day holding time criteria.

II. INITIAL CALIBRATION

Initial calibration of the instrument must be performed using a minimum of five standard concentrations. For initial calibration to be accepted, five system performance check compounds (SPCCs) must meet the following minimum average response factors (RFs):

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

SPCCs are used to check compound instability and to check for degradation caused by contaminated lines or active sites in the system. The average RF for each of the five SPCCs met the minimum calibration criteria listed above.

Additionally, the relative standard deviation (RSD) of the response factors of the initial calibration curve should be less than or equal to 15 percent for all target analytes and less than or equal to 30 percent for six calibration check compounds (CCCs). The six CCCs are: 1,1-dichloroethene, chloroform, 1,2-dichloropropane, toluene, ethylbenzene and vinyl chloride. If the RSD of the target analytes is 15 percent or less and less than 30 percent for the six CCCs, then the RF is assumed to be constant over the calibration range and the average RF can be used for quantitation.

If the RSD of the target analytes exceeds the 15 percent criterion, other calibration options can be employed. As discussed in Section 7.0 of Method 8000, linear calibration using a least squares regression may be used with the initial calibration data to demonstrate the instrument calibration linearity. Least squares regression was used for the target analytes listed above, which did not have an average RF of 15 percent or less. For initial calibration to be accepted using a least squares model, the coefficient of determination must be greater than or equal to 0.99.

Initial calibration of GC/MS #1 was performed on August 26, 2002 using a minimum of five concentrations ranging from 0.5 to 200 µg/L, which meets the method requirement of initial calibration using five concentration levels. GC/MS #1 was used to analyze OC-GW-OW8-082202 (100 dilution), OC-GW-OW8k-082202, and the trip blank on August 27, 2002. All target analytes and CCCs met the 15 percent calibration criteria for GC/MS #1 except for dichlorodifluoromethane, dibromochloromethane and bromoform. The coefficient of determination exceeded 0.99 for these three compounds. Therefore, all criteria for initial calibration of GC/MS #1 were met for all compounds and no qualification is necessary.

Initial calibration of GC/MS #9 was performed on August 26, 2002 using a minimum of five concentrations ranging from 0.5 to 200 µg/L, which meets the method requirement of initial calibration using five concentration levels. GC/MS #9 was used to analyze samples OC-GW-OW8-082202, OC-GW-OW8k-082202 (100 dilution), OC-GW-OW5-082202 and OC-GW-OW4b-082102 on August 28, 2002. All target analytes and CCCs met the 15 percent calibration criteria for GC/MS #9 except for vinyl acetate. The calibration curve for vinyl acetate was fit with a quadratic equation. The coefficient of variation exceeded 0.99 for this compound. Therefore, all criteria for initial calibration of GC/MS #9 were met for all compounds and no qualification is necessary.

III. CONTINUING CALIBRATION

The initial GC/MS calibration is verified once every 12 hours by analyzing a 4-bromofluorobenzene tuning standard and a calibration verification standard (a midpoint check standard) and prior to analyzing any samples. The calibration verification standard must contain each of the five SPCCs used during initial calibration. The minimum RF for each SPCC must meet the criteria specified for initial calibration (i.e., 0.10 to 0.30). In addition, initial calibration is checked using the CCCs used during initial calibration. If the percent difference (%D) of each of the CCCs is less than 20 percent, the initial calibration is assumed to be valid.

Samples were analyzed on August 27 and 28, 2002. Prior to sample analysis, a 50 ng BFB tuning standard was analyzed. Mass ion abundance criteria were met for the system. Each of the five SPCCs and the six CCCs were contained in a mid-point check standard at concentrations of 25 ppb. The RF for each of the SPCCs was greater than the criteria specified and the %D between the continuing calibration and the initial calibration for each of the CCCs was less than 20 percent. Therefore, the initial calibrations were validated and continuing calibration criteria were met.

IV. METHOD BLANKS

A method blank must be analyzed with each batch of samples for each matrix type immediately after initial calibration is verified and before sample analysis. A total of three method blanks were reported. No target analytes were detected at concentrations above their respective reporting limits in the blanks analyzed between August 27 and 28, 2002. Therefore, all criteria were met and no further action is required.

V. SURROGATES

Three surrogate spikes (dibromofluoromethane, toluene-d8 and 4-bromofluorobenzene) were added to each environmental sample, QC sample, and method blank, as required by the method. Surrogate control limits were established by the laboratory and are 80 to 120 percent for all three surrogates.

All surrogate recoveries were within the acceptable control limits.

VI. MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Three MS and MSD sample sets were analyzed with this group of samples. Acceptance limits for MS and MSD recoveries and the relative percent difference (RPD) between the MS and the MSD were statistically determined by the laboratory, which meets method requirements, and are listed in the following table:

MS/MSD Acceptance Limits

Spiking Analyte	*Acceptance Limits*	
	MS/MSD Recovery (%)	*RPD*
Benzene	70-140	20
Bromodichloromethane	75-145	20
Bromoform	55-150	40
Chlorobenzene	75-130	20
Chloroform	75-150	20
Dibromochloromethane	70-145	20
1,4-Dichlorobenzene	75-125	20
1,1-Dichloroethane	60-130	20
1,2-Dichloroethane	65-140	20
1,1-Dichloroethene	65-165	20
Ethylbenzene	75-135	20
Methyl tert-butyl ether (MTBE)	65-150	20

Spiking Analyte	*Acceptance Limits*	
	MS/MSD Recovery (%)	*RPD*
Naphthalene	50-155	30
Tetrachloroethene	75-155	20
Toluene	75-135	20
Trichloroethene	75-130	20
Vinyl Chloride	40-190	25
o-Xylene	75-150	20
m,p-Xylene	70-140	20

The percent recoveries for the MS and MSD samples were within acceptable criteria for all spiked compounds for the three analytical batches.

The relative percent difference (RPD) between the MS and MSD samples were within acceptable criteria for all compounds in the three analytical batches.

VII. LABORATORY CONTROL SAMPLES (LCS)

Three LCS samples were analyzed with each batch of samples, which meets the analytical method requirement of one LCS per analytical batch. Results from the LCS sample were included in the analytical report. All LCS analyte recoveries were within the acceptance limits established by the laboratory, which demonstrates acceptable accuracy.

VIII. REGIONAL QUALITY ASSURANCE AND QUALITY CONTROL

One field duplicate pair was submitted with this group of samples. Sample OC-GW-OW8K-082202 is a field duplicate (split) of sample OC-GW-OW8-082202. Both samples were analyzed for VOCs. Results of the duplicate analyses are summarized in the following table:

Duplicate Sample Results

Analyte	*Sample Concentration (μg/L)*	*Dilution Factor*	*Duplicate Concentration (μg/L)*	*Dilution Factor*	*RPD (%)*
Sample ID:	*OC-GW-OW8-082202*		*OC-GW-OW8K-082202*		
Acetone	< 200	20	89	1	n/a
Benzene	< 10	20	5.3	1	n/a
Chlorobenzene	< 20	20	1.1	1	n/a
Chloroform	350	20	340	100	2.9
1,2-Dichlorobenzene	< 20	20	1.2	1	n/a
1,1-Dichloroethane	46	20	45	1	2.2
1,2-Dichloroethane	49	20	86	1	55
1,1-Dichloroethene	1,700	20	1,500	100	13
cis-1,2-Dichloroethene	< 20	20	9.7	1	n/a
trans-1,2-Dichloroethene	81	20	66	1	20
Methylene chloride	< 100	20	140	1	n/a
1,1,1,2-Tetrachloroethane	< 20	20	1.9	1	n/a
Tetrachloroethene (PCE)	9,400	100	10,000	100	6.2
Toluene	< 20	20	4.7	1	n/a
1,1,1-Trichloroethane	49	20	47	1	4.2
1,1,2-Trichloroethane	< 20	20	25	1	n/a
Trichloroethene (TCE)	910	20	840	100	8
Trichlorofluoromethane	1,000	20	910	100	9.4
Trichlorotrifluoroethane (Freon 113)	2,100	20	2,300	100	9.1

Notes: Only detected analytes are shown on the table was No field duplicates were submitted

In accordance with the project work plan, a relative percent difference (RPD) between duplicate water samples of 20 percent or less demonstrates acceptable precision. As shown on the table above, the RPD between detected analyte concentrations was less than 20 percent for all compounds except 1,2-dichloroethane, which was 55 percent. Because the 1,2-dichloroethane concentrations were within the same order of magnitude and because all other detected concentrations were in good agreement, the elevated RPD is not significant enough to warrant qualification. Therefore, no further action is required.

One trip blank was also submitted and analyzed for VOCs. No detectable concentrations of VOCs were reported in the trip blank, which demonstrates that cross-contamination during sample transport and storage did not occur.

IX. INTERNAL STANDARDS

Internal standard (IS) area counts and retention times for samples analyzed on August 27 and 28, 2002 were within validation criteria. IS area counts for all samples analyzed were within -50 - +100 percent of the IS area count from the daily calibration standard. IS retention times were within ±30 seconds from the retention time of the associated daily standard.

X. TARGET COMPOUND IDENTIFICATION

All positive compound identifications were confirmed through the mass spectra library.

XI. COMPOUND QUANTITATION

Several positive results were recalculated to ensure that compound quantitation was accurate. No errors were encountered. Compound quantitation was based on the initial calibration average RF.

XII. SYSTEM PERFORMANCE

The system performance was acceptable.

XIII. OVERALL ASSESSMENT OF VOC DATA

All QC criteria evaluated during data validation of the VOC analyses were within acceptable limits. No QC issues were encountered that were significant enough to require qualification of the data. Therefore, all VOC data can be used as reported and meet the project objectives.

1,4-DIOXANE DATA ASSESSMENT

Three samples were analyzed for low-level 1,4-dioxane. Because there is no analytical method promulgated by EPA for the analysis of low-level 1,4-dioxane, Weck followed a modified EPA Method 8270C method, but using isotopic dilution with GC/MS. Method 8270C QC criteria were used during this review to assess data for general compliance. Data reviewed for the 1,4-dioxane analyses include: holding times, instrument calibration, blank results, LCS recoveries, and MS/MSD recoveries and precision.

I. TECHNICAL HOLDING TIMES

According to Method 8270C, the holding time for 1,4-dioxane in water is 7 days from sample collection until extraction; and 40 days from extraction to analysis. The three samples (OW8, OW8k and OW4b) collected on August 21 and 22, 2002, were extracted on September 3, 2002, which is 11 to 12 days from sample collection, and analyzed on September 13, 2002. Although Method 8000 specifies a holding time of 7 days until extraction, Weck Laboratories has shown through internal studies that 1,4-dioxane is stable for much longer periods of time. Therefore, Weck uses a criterion of 14 days from sample collection to extraction as a conservative holding time for 1,4-dioxane. Because there is no promulgated method for the analysis of low-level 1,4-dioxane, the data will not be qualified due to holding time exceedances.

II. INITIAL CALIBRATION

Initial calibration of GC/MS #6 was performed on September 12, 2002, using seven standard concentrations ranging from 0.5 to 40 ug/L, which meets the 8270C requirement of initial calibration using five concentration levels. A DFTPP tune check standard at 50 ng was analyzed prior to calibration and passed acceptance criteria. The percent relative standard deviation (%RSD) of the response factors over the entire calibration curve was 4.5 percent, which meets general criteria (specified in Method 8000) of less than 20 percent. Therefore, the calibration curve was considered linear.

III. CONTINUING CALIBRATION

The initial calibration of GC/MS #6 was verified prior to sample analysis by analyzing 10 ug/L standard (mid point of the curve). The difference between the continuing calibration verification standard and the initial value was 0.5 percent, which demonstrates that the initial calibration was valid.

IV. METHOD BLANKS

A method blank was analyzed with this batch of samples to verify that the instrument is free from contamination. 1,4-dioxane was not detected at a concentration above the reporting limit of 0.5 ug/L in the method blank. Therefore, no further action is required.

V. LABORATORY CONTROL SAMPLES (LCS)

One LCS sample was analyzed with this batch of samples, which meets Method 8270C criteria. Results from the LCS sample were included in the analytical report. The LCS recovery in this batch was 109 percent, which is within the acceptance limits of 77 to 133 percent.

VI. MATRIX SPIKE/MATRIX SPIKE DUPLICATES

One MS and MSD sample set was analyzed with the batch of samples analyzed on September 13, 2002. MS and MSD recoveries were 117 and 115 percent, respectively, which are within the acceptance criteria of 53 to 136 percent. The RPD between the MS and MSD samples was less than 2 percent, demonstrating acceptable precision.

VII. REGIONAL QUALITY ASSURANCE AND QUALITY CONTROL

Sample OC-GW-OW8K-082202 is a field duplicate (split) of sample OC-GW-OW8-082202. The primary sample contained 1,4-dioxane at 830 ug/l and the duplicate at 840 ug/l, which represents an RPD of 1 percent. Therefore, acceptable precision was demonstrated.

VIII. INTERNAL STANDARDS

Internal standard (IS) area counts and retention times for samples analyzed on September 13, 2003 were within validation criteria. IS area counts for all samples analyzed were within -50 - +100 percent of the IS area count from the daily calibration standard. IS retention times were within ±30 seconds from the retention time of the associated daily standard.

IX. TARGET COMPOUND IDENTIFICATION

All positive compound identifications were confirmed through the mass spectra library.

X.COMPOUND QUANTITATION

One of the positive results was recalculated to ensure that compound quantitation was accurate. No errors were encountered. Compound quantitation was based on the initial calibration average RF.

XI. SYSTEM PERFORMANCE

The system performance was acceptable.

XII. OVERALL ASSESSMENT OF 1,4-DIOXANE DATA

Although no EPA method exists for the analysis of low-level 1,4-dioxane, the project data were reviewed for general compliance with standard QC criteria requirements specified for organic analyses. Also, QC sample results were evaluated against laboratory specified acceptance criteria for method compliance. No significant QC issues were encountered during the data review. Therefore, the 1,4-dioxane data can be used for the project purposes without qualification.

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